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Technological Response of Indian Industry to Globalisation and Liberalisation
—Educational Imperatives

RAJESH SINGH

Scientific Method for Research and Project

J.S. VERMA

The Purpose of Legal Education
—Convocation Address

Association of Indian Universities

UNIVERSITY OF DELHI

ANNOUNCES

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K.K. PANDA
Registrar

Last Date of Receiving Completed Form : April 30th, 1998.

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IN THIS ISSUE

Editor :
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Technological Response of Indian Industry to Globalisation and Liberalisation

Educational Imperatives

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Economic Reforms

The economic reforms were introduced in India in 1991 with diversified objectives. The country was facing severe foreign exchange crunch because of the mounting debt, and aggravating oil crisis in the wake of Iraq-Kuwait conflict which was followed by a high-tech war lasting more than 40 days. India opted for not standing with allied forces against Iraq maintaining its true non-aligned stance India's economy was in a terrible shape.

The revival process could be sought only by taking some ultimate steps towards liberalization of economy, and globalization of trade, commerce, and industry. India could survive by increasing her exports and cutting down on imports. In order to find markets for our products, we were required to be competitive globally both price-wise and quality-wise. In order to become competitive price wise, we did not explore the economies of scale and scope but we chose an easier way out and devalued our currency in comparison to the hard currencies of the world. The exports did rise, but not in the desired sectors. Another implication for going in for devaluation of currency option was to attract investments in Indian industries from abroad. Foreign investors were demanding very heavy concessions from Indian government and they were also sore on their experience of late 1970s when they were asked to pack up under very humiliating circumstances. Investors were also expecting some kind of assurance from the union government that the same will not be repeated. So initially they were quite watchful. But steps taken by the government in this direction were quite significant. Initially the foreign investors were allowed to participate in equity holding, and subsequently extending the same up to 100% limit left no doubts in the minds of investors.

The Early Impressions

All efforts up to this stage went into smoothing the ground for the entry of foreign investors, multinational companies (MNCs), transnational companies (TNCs), joint-ventures (JVs) and technological alliances into Indian industry. What had happened upto late 1993 and early 1994 (Kirkpatric 1994) was :

**Senior Faculty, Institute of Computer Sciences & Electronics, **Senior Professor and Dean, Faculty of Management Studies, Head of School of Distance Education and Chairman of School of Defence and Management Studies, ***Research Scholar, Institute of Management Studies, Devi Ahilya University, Indore (M.P.), ****Senior Professor, Department of Management Studies, IIT, Delhi.*

(i) Increase in the exports of natural and agricultural products and thereby increasing their prices and deterioration of quality in the domestic market.

(ii) Increase in imports of high-technology and capital goods without a proper requirements and feasibility analysis for such technologies.

(iii) Increase in pressures on infrastructural industry like communication, power, transportation, and other related service sectors.

Meantime the Government of India had floated an issue of NRI bonds at a very handsome rate of interest and mopped up fabulous amount of money in US dollars to pay interests and repay other debt obligations, and hence, improving its foreign exchange position only superficially (*Background Material, Interaction Meet on Acquisition of Technology from Abroad*, Department of Scientific and Industrial Research (DSIR), GoI, New Delhi, 1995).

Global Competitiveness and Role of Technology

With India signing General Agreement on Trade and Tariffs (GATT) and subsequently becoming a member of World Trade Organisation (WTO), its commitment to liberalization and globalization was confirmed to the investing countries of the world. Another big advantage which we are likely to realize is that our products will remain competitive because they are not likely to attract heavy duties in destination countries (as they use to attract earlier). But still, we have to compete with the products from the countries enjoying the status of most favoured nation, which are of course, different in the different parts of the world.

In the beginning of 1994, financial condition of the country had improved only marginally and financial crunch was far from over. Our credibility in the international monetary market had improved because we had paid back the interest on foreign debts well before the due date. We could say that we had no immediate foreign exchange problem and we had enough money in foreign exchange reserves to survive for quite some time even without any exports, as a layman sees the foreign exchange position in India. But even today it cannot be called 'satisfactory'.

On other counts, the economic reforms could not do much because the Indian industry was not responding to the global market needs in the required manner. The explicit objective of economic reforms as emphasised by government and perceived by people was the development at grassroot level. Concrete steps have so far been lacking to improve the condition of a common man in the country. On the other hand the masses are still awaiting the benefits of globalization and liberalization which are not seemingly forthcoming.

We have been able to develop a technological base in our industry to produce quality products which are competitive in the global market. Our industry has failed to explore the economies of scale and scope to become and remain market leaders. Barring a few exceptions, what we have imported is 'Pea-nut' technology or the technologies which are either not cost-effective or obsolete in nature. There could be several reasons for such a pathetic condition on technology front. One reason could be the entire reforms were looked from a short term perspective in the sense that, the Government of India appears to get rid of foreign exchange crunch only on temporary basis. One gets this impression because pre-reforms exercises were not carried out systematically, and elaborately, leaving industry and people only at the receiving end enabling only a reactive response. The fear of short lives of reforms created a panic in all the industries and there was a mad rush for technology alliances and collaborations without meticulously looking into needs for such technologies and availability of the same locally

What Went Wrong?

When technology transferred from developed countries to India, the success rate of such alliances were not 100%. Restricted equity participation was a hurdle, because the firm which is technologically more advanced was likely to lose management control once every thing gets going smoothly. The same happened with Mercedeze Benz in Tata Mercedeze Benz, Bajaj Piagio, in 1970s and Bajaj-Kawasaki in 1994. Several joint ventures did not materialise, e.g., Tata-Honda (However the licence is now cleared for Honda to enter into Indian market with cars but with Hero group). On the other hand there have been some success stories too like Kinetic-Honda, DCM-Toyota motors, ICIM-Fijutsu, Modern-Siemence Insulators, Wipro-Epson, HCL-HP, etc. The general observation is that wherever the Indian partner was strong in Indian markets and foreign counterpart was strong in other markets, the joint-venture did not prosper and wherever the Indian partner was a weak link in that particular technology area, the joint venture has succeeded (*Research and Development in Industry — An Overview*, December 1994, Department of Scientific and Industrial Research).

In the absence of appropriate organizational plans, heavy price was paid initially and dependence on foreign counterpart did not reduce with time. On the top of this, fast rate of incremental innovations in old technologies was also partly funded by Indian counterparts.

Technology acquisition followed by continuous incremental innovations is crucial for sustainable development in general.

In the entire process of liberal technology acquisition, what has happened so far can be described as follows :

i. More of food and beverages companies have moved in, e.g. Coke, Pepsi, Mcdonald, Kentucky Fried Chicken, etc.

ii. People think only brand names will do such as, HCL-HP, Tata-IBM, Wipro-Epson, Burlington, Allwyn-Nissan, DCM-Toyota, Hero-Honda, etc.

iii. Hi-tech companies are moving in only in very less number.

iv. Production facilities have not ceased to be location specific.

v. More marketing outlets and distribution channels for the products of developed countries, e.g., IBM Power PC, Compaque, Apple Power PC, Motorola Radio Pagers, Louise ready-made garments, etc.

vi. Distrust in local scientist and technologists is all time high.

vii. Indigenous technologies developed by premier public sector companies like BHEL, SAIL, BEL, BEML, etc. were looked down at not only by private sector but even by government sector. Government officials and ministers are busy signing Electric power projects with MNCs and private investors using foreign technologies while BHEL is selling its power generating systems up to 500 MW to other developing countries — in globally competitive bidding.

What Should be Done Now?

Technology revolution is also required in service sector industries like Banking, Finance, Small and Medium Firms, Construction, Law and Judicial Systems, Environment, Rural Development, Transportation, Communication, Education, and Health Services.

Earlier we had a very rigid technology policy but now a not so clear technology policy exists. Technology driven small and medium enterprises specially deserve government's attention for their survival and growth in globally competitive market. The role of small and medium technology firms in creation of new technology is noteworthy particularly in biotechnology, information technology and micro-electronics technology (*The Hindu*, Jan., 5, 1995).

While globalization is going on in full swing, the decentralization of services are also taking place with the same pace. Now small and medium scale firms and even individuals have access to firms interested in having either a joint-venture or a technology alliance. IBM has more than 75,000 joint-ventures all over the world and many of them are owner-CEO type of companies (*Business Today*-Dec., 1994, Jan. 1995).

Government may think in terms of introducing some measures for checking the 'Technological Health' of the firms going in for technology acquisition and it should be allowed to continue only if they have shown considerable reduction in dependence on their foreign counterparts. That means there should be a technology plan for continuous improvements in the technology which has been acquired by a firm.

Technologists should be encouraged to promote their own firms with substantial support from government to work and patent in India. Roughly 45% new patents in micro-electronics and information technology industries are in the name of individuals (*Siddharthan*, 1995).

Government should increase revenue expenditure (investment) in technology development activities and bring in at least 15 to 25% of total revenue expenditures on technological developments in small and medium enterprises.

The role of small and medium technologically driven enterprises is very crucial in the development of economy of a country. Survival rate of technology driven joint-ventures is also an important concern in view of the fact that technology life cycle is continuously shrinking (*Chatterjee and Sushil*, 1994).

Every firm which has acquired technology from abroad must plough back a substantial part of its revenue in technology management activities which include R&D.

The economic reforms are irrevocable and we have already reached a point of no-return in the process. What we need to do now is to monitor and channelize the process of reforms in the desired direction. If we have to benefit from the globalization of markets and liberalization of trade, commerce, and

industry, then we will have to develop a very strong technology base in our manufacturing and service sectors. An all round effort is required from all the three players, i.e. Government, Society and Industry in this regard. Technology leadership decides the market leadership in the long run, market leadership dictates economic leadership and economic leadership implies political leadership. Hence if we wish to be the number one citizens of the world, then we have to be technological leaders, in order to become technological leaders we need to recognize technology management as an important function and manage it effectively.

Educational Reforms to Meet the Global Challenge

In comparison to other developed countries, India introduced the reforms quite late and the results of these reforms are further delayed because of lack of appropriate planning and brief make-ready time. In the reform process, it is always the trained and motivated human resource which is instrumental in encashing on the opportunities in the environment. In the present scenario, the general feeling is that the employment has been generated in the select areas while unemployment in other areas has increased. MNCs and TNCs are not satisfied with the quality of manpower available and need to train them in even basic functions. Management graduates with non-engineering background find it quite difficult to catch-up with high-tech management paradigms. Engineering graduates with non-management background trail in the race with professional managers.

It has, therefore, become necessary to increase technical input in engineering and technology programmes. In this process a large number of interdisciplinary courses will have to be identified, and traditional courses like Industrial Engineering, Database Management Systems, Intelligent and knowledge based systems, and mathematical modelling and computer simulation, will have to be redesigned and made available to students from other branches. A few premier education and research institutes like Indian Institutes of Technology (IITs) are offering these types of facilities while prestigious management institutes are still operating on traditional specialization courses.

The revolution in information technology (IT) and telecommunication sectors have changed the concept of management education worldwide. Managers at all levels are acquiring skills to handle IT tools to their advantage, to streamline the decision making process. In the field of management education, we do not need classroom based teaching methodology but technological tools for enhancing quality and quantity of management education. Technology helps in educating students located at geographically distant locations, raising hopes and aspirations of people staying at remote areas and offers the freedom to the students to learn efficiently at their own pace and flexible timings. On the other hand, it helps teachers to enhance their communication skills. The technological tools for delivery of education have already progressed from classroom aids like slide projector, overhead projector and LCD projector to distant education tools like audio and video tapes, radio and TV broadcasts, cable TV, tele-education through satellite and video conferencing, floppy diskettes and CD-ROMs for large capacity data storage, networking via ERNET and INTERNET and a futuristic concept of bringing satellite channels directly to homes by DTH (direct to home) service. Out of these electronic tools, notably the broadcast TV is a very rich medium which offers an excellent opportunity in the education delivery as the best teachers, noted personalities, and top quality specialists can talk directly to a large number of students. CD-ROMs run on a multimedia PC are an ideal option for education delivery to the remote areas where networking may not be cost effective. They store large amount of material in the form of documents, pictures, maps etc with sound and video added. Internet communication is a very strong medium of education delivery which makes the concept of classroom at home a reality by way of education through E-mail and web browsing on the world wide web (*Prashant*, 1997).

Desktop video conferencing systems with fully integrated collaborative software have recently emerged as a viable technology for creating an atmosphere of collaborative telelearning. These systems represent merging of various technologies like video conferencing, collaboration support software, and audio all packaged in a PC. The collaboration support software allows remote parties to jointly (and synchronously) work on documents, spreadsheets and graphics via an ISDN (Integrated Services Digital Network) telephone call. Either party can control the application programme to make changes which are immediately reflected on both screens. This technology represents a model to mimic how two students would work jointly using their PCs at distant locations (*Alavi*, 1995).

In recent years the library community has been preoccupied with the impact of emerging IT on such functions as the maintenance of card catalogue, circulation control, interlibrary loans, library networking, on line bibliographical search, resource sharing,

collection building and other library oriented activities. IT using voice, text, digital, micrographic media, electronic documents are also causing significant changes in the way information workers can perform traditional office activities. The information super highways have revolutionised life in many western countries and Japan, bringing work place to home and making virtual office, virtual classroom and virtual library possible. Libraries, which upto very recent times were essentially stacking print material, have now begun to acquire electronic media like CD-ROMs and multimedia packages. In the coming years, libraries will have to prepare themselves for conversion to electronic libraries also commonly referred to as digital libraries. For connecting to the superhighway, the computer can hook up with Internet through NICNET of National Informatics Centre or ERNET of Department of Electronics (*Kaula*, 1997).

With the advances and growth taking place in the interconnectivity of various academic institutions and industry in India, the problems encountered in effective sharing of resources can be addressed by a computer based implementation. The ERNET and VSNL are providing the connectivity necessary for implementing such a system, the Internet. The information shared and accessible on Internet is estimated to be 80 million pages. The goal of improved quality in management education, however, can be served by taking a more focused approach of building an Intranet that connects the Indian management institutions and can be accessed by member institutions only. The tools necessary to share the resources will include use of Internet connectivity through VSNL or ERNET, web browsers, web servers, and security firewall as the heart of Intranet, and software packages for discussion forums, network based electronic bulletin boards and list servers for low volume discussion groups as well as for member institutions with limited connectivity and bandwidth. In the initial stages, the application to be implemented on the suggested IIM Intranet are — sharing of library resources, faculty based collaboration, student placement information and conferencing on the electronic media (*Bhasker*, 1997).

Progressively, electronic media will be more and more in demand. In India, multi technologies coexist. On one hand, we have traditional institutes untouched by waves of technological revolution whereas on the other hand there are institutes with state of art facilities of education technology, for example, there are still many institutes where the teaching is limited to chalk and blackboard based lectures whereas there are institutes having LAN, WAN, worldwide web and multimedia systems. This wide disparity in delivery of, education is mainly due to lack of training of teachers for these new technologies utilisation. There is a need to develop positive attitude in teachers, parents and public for these technologies for educational communication (*Goel*, 1997).

Technology management education should therefore evolve a curriculum that meets the needs of the people above and below the level of top technical managers. The type of education programme needed by the industry would provide management courses focused on challenges of managing technical people, project management, interpersonal skills, technological information, forecasting, business strategies, and technical updating. Large companies should consider building a technology management education programme that bridges the gap between technical education and management training. Universities must develop such programmes between their management and technical schools and engage in research in the field (*Weimer*, 1991).

The need of the hour is to draw out graduates with a very broad base knowledge of interdisciplinary areas and specialization in micro areas. Some new courses pertaining to the current trends in global market that may be included in the courses of study of engineering students are :

1. System Analysis and Methodology (SAM)
2. Total Quality Management (TQM)
3. Management of Technology (MoT)
4. Business Process Re-engineering (BPR)
5. Value Engineering
6. Managerial Communication
7. Research Methods in Management
8. Long Range Planning
9. Design and Implementation of Information Systems
10. Intelligent Systems
11. Principles and Practice of Management
12. Human Behaviour at Work
13. Management Accounting
14. Financial Management
15. Principles of Marketing Management
16. Principles of Personnel Management

17. Principles of Production and Operations Management
18. Management of Manufacturing Flexibility
19. Creativity and Innovation

The courses of study which may be included in the syllabi of management programmes are :

1. Management of Technology (MoT)
2. Total Quality Management (TQM)
3. Business Process Re-engineering (BPR)
4. System Dynamics
5. Database Management System (DBMS)
6. Design and Implementation of Information System
7. Decision Support System (DSS)
8. Intelligent and Knowledge Based Systems (IKBS)
9. Industrial Engineering
10. Computer Integrated Manufacturing (CIM)
11. Maintenance Management
12. Computer Networks and Distributed Data Processing
13. Total Productivity Management
14. Manufacturing Policy
15. Flexibility in Management
16. Management of Innovation
17. Management of Change

Some successful experiments have been done by some universities like, Devi Ahilya University offers two year Master of Computer Management (MCM) programme, and M.Tech. in Future Studies and Planning, Poona University offers two years MCM programme, Indian Institute of Management, Calcutta has started MCM programme, again of two years duration, and Patna and Baroda universities are also offering the programmes of studies on similar lines. Indian Institute of Technology Delhi has taken the lead in offering M.Tech. (Management and Systems). IIT Bombay has already started M.Tech. (with specialization in Management of Technology (MoT) from the academic year 1995-96.

A major turn-around in the design and contents of engineering, technology, and management masters and research degree programmes will help the country go a long way in providing the much required human resource base and in turn realize the objectives of liberalization of economy and globalization of the market.

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Scientific Method for Research and Project

Rajesh Singh*

Projects and dissertations are an essential part of the academic curriculum whereas research has become a modern phenomenon of development. From antiquity man has traversed a long path of development making discoveries and undertaking researches to seek out the deep hidden truth of the universe, to reach this stage of modern life. How has this become possible? Karl Pearson is very right when he says "There is no short cut to truth, no way to gain knowledge of the universe except through the gateway of Scientific method."

Well, before discussing the Scientific Method, let us briefly discuss what 'Research', 'Dissertations' and 'Projects' are, and what are the major differences and similarities among them. Fundamentally, all three terms bear the same meaning. Research aims to seek and establish some fundamental or elemental truths by furnishing enough evidence and proof. It also aims to review or to re-establish what has already been established as a fundamental truth, to find out new patterns from the authentic Scientific theories and to further modify existing notions. A water-tight demarcation of differences is not possible among the three terms — they are frequently used for the same concept. The only major difference among them is that of scope. Projects are smaller than dissertations in scope, and dissertations from researches. A project may be regarded as the execution part of a research with a limited scope. In fact the aim of academic curriculum projects is to make the students acquainted with laboratories and prepare them for future scientific researches. Dissertations aim at adding a new dimension to already explored phenomena. In the case of some researches, ideas are developed towards absolutely new and innovative outcomes. Such researches are called 'pure researches.'

Science is generally defined as the systematic study of a given subject field to gain knowledge. Thus the goal of science becomes knowledge whereas systematic study becomes the process through which the defined goal is obtained. In fact, the goal of any kind of study is to obtain knowledge or truth. It is only this systematic process which distinguished science from other methods of obtaining knowledge. Lundberg has rightly remarked "All that the term science is applied to a particular field comes to mean, is a field which has been studied according to certain principles i.e. according to scientific method."

Now we need to see what 'Scientific Method' is. Simply stated, it is systematic observation, a classification of ideas which have been accumulated through observation, organisation of these classified ideas into data and lastly, interpretation of the data. Karl Pearson says, "The Scientific Method is marked by the following features : a) Careful and accurate classification of facts and observation of their correction and sequence, b) the discovery of scientific laws with the aid of the creative imagination, c) Self criticism and the final touch stone of equal validity for all normally constituted minds."

Analysing this definition, it becomes clear that scientific methods have two aspects: one that deals with the methods employed and other with the results achieved. In fact both are equally important. But the latter has been regarded more important by Wolf who says, "Any mode of investigation by which science has been built up and is being developed is entitled to be called a scientific method." So it is a matter of opinion. But both seem to be of equal importance. If one does not employ the right method, one will certainly not get the desired results.

Characteristics of Scientific Method

A summary of the chief characteristics of the Scientific Method will help delineate different steps of scientific study. The chief characteristics are :

1. *Verifiability:* The conclusions drawn through a scientific method are subject to verification at any time. Verifiability presupposes that the phenomenon must submit to being observed and measured. This will bring greater exactitude to our verification. For example, we know that matter expands on heating. In order to verify this we can heat matter and see whether it expands. Again, the rate of expansion in all the matter is not the same. Thus from the general scientific law that matter expands on being heated, we can proceed to find out the exact degree of expansion of each kind of matter. This is only possible when the expansion of matter be measured.

2. *Generality:* Scientific laws are universal. They are primarily concerned with the types, kinds or classes of objects and events "of which the individual

*Central Library, Indian School of Mines, Dhanbad-826 004.

object or event is treated merely as a specimen or an instance". Contrary to the social sciences, which are heterogenous in nature, universality in physical science is possible due to homogeneity of basic qualities.

3. *Predictability:* The result of a scientific method can be predicted with reasonable accuracy. For example it can be said with sufficient accuracy that water will change into ice, at zero degree celsius. But it should be kept in mind that predictability is based on two factors, viz. fixity of relationship between cause and effect and the stability of the causative factors themselves. On the one hand predictability depends upon the nature of the phenomenon itself and on the other, upon our knowledge of various causative factors.

4. *Objectivity:* "The first requisite of all sound knowledge is the ability to get naked facts and not be influenced by mere apppearance or by prevalent notions or by one's own wishes." Thus when a phenomenon is observed in its true form without being affected by the observer's own views, it may be termed as an objective observation. "The main criterion of objectivity is that all persons should arrive at the same conclusion about the given phenomenon. It is also essential for verification. Objectivity is fundamental to all sciences.

5. *System:* The four characteristics discussed above deal with the result obtained. This last one pertains to the method of arriving at the result. Scientific conclusions are not only true but also born of a systematic mode of investigation. It is only under such circumstances that the results can be verified. This is what Lundberg calls "Formality and Rigorousness". Every science has an accepted mode of investigation and inferences which must be adhered to. The result arrived at by means of haphazard methods, even if true, cannot be called scientific because their accuracy is purely accidental. Wolf avers that not only result but the mode of investigation too is important.

We have already stated that scientific method implies systematic study. But what should be the system, from general to specific i.e. from broad to narrow or vice versa? It has been the most discussed phenomenon of the scientific method. Because of the nature of study, type of phenomena under study and the researcher himself, the procedure to be adopted in a scientific method may differ. However, the basic principles and steps laid down below have been found quite successful. They are capable of showing the proper way from very inception of a research to its completion.

Hypothesis Formulation

One can't start any work without any prior idea. Take for example this write up. I found boys coming to the library and simply asking me: Sir, we want some books on 'projects'. But the topic or idea on which one can undertake a project was unknown to them. I conceived the idea of writing an article on the topic. The basic challenge in front of me was to provide a clue as to how one should approach projects. What are the necessary requirements? And the result of this efforts is presented here. The aim is to point out that before starting any plan, an idea, however vague it may be, should be kept in mind. Only then can one proceed to find out whether the ideas conceived are true. They may be totally or partially correct or altogether false, but they do help to get going. For new discoveries, one cannot proceed in complete ignorance. These primary ideas which guide us in our study may be termed as hypothesis.

According to Good and Hatt, "a proposition which can be put to test to determine its validity" is a hypothesis. A more elaborate and clear idea of a hypothesis has been given by Lundberg: "A hypothesis is a tentative generalization, the validity of which remains to be tested. In its most elementary stage the hypothesis may be any hunch, guess, imaginative idea, which becomes the basis for action or investigation." What is more striking is that a hypothesis and a theory are not the same, although they are closely related. A theory is an elaborate hypothesis. A hypothesis some times emerges from a theory. It is a generalization drawn from the theory and when it has been tested and found correct, it becomes a part of the theory itself. Thus a theory in its early form is only a hypothesis and the two are interdependent.

The importance of hypothesis can hardly be overrated in any scientific research In fact it is the very foundation of scientific research A good hypothesis which is clear, simple and scientific makes the enquiry more specific and to the point. It helps in deciding the direction in which to proceed, in selecting pertinent facts and moreover it helps in drawing specific conclusions. "Without hypothesis the research is unfocused, a random empirical wandering". The results cannot be stated as facts without clear meaning. Hypothesis is the necessary link between theory and investigations, which leads to discovery, or to addition of knowledge.

There are various sources of hypotheses. This bulk of primary idea i.e. the hypothesis, which may strike the researcher's mind in his day to day work is important. Take for example, the famous incident

of apple falling from tree, which puzzled Newton. Culture proves a good source of hypotheses. Indian culture, for instance, has a metaphysical basis for hypotheses. Scientific theories also lead us to form further generalizations or corollaries. These corollaries or generalizations form a part of the hypothesis. Sometimes a hypothesis is formed from analogy too. However, the formation of a hypothesis is affected by the way in which an individual reacts to each of these sources. Sometimes the facts are there, but only the right individual sees it in a right perspective and formulates a hypotehsis. It was only Newton who could formulate the idea of the force of gravitation from the falling of an apple.

Observation and Collection of Data

After the hypothesis has been formulated, the next step is to test its validity. This requires observation of facts and collection of data. Data is the raw material of information. When data is processed it becomes information. Data can be in various forms viz. tabular, graphics, etc.

In this respect the first thing to be decided is the nature of the information that would be necessary to establish the validity of the hypothesis and wherefrom this information can be collected There are various methods of collecting data. For all theoretical investigations i.e. where hypothesis have been derived from existing scientific theories, a rich library will certainly be useful. While collecting data one should ensure that the data are related to the subject under study. They must be adequate and accurate. Adequacy of data deals with the sufficiency of information to test the validity of a hypothesis and its accuracy.

Analysis and Synthesis

The data, related to the hypothesis, which is collected, must be processed and analysed to draw proper inferences. "The discovery of order in the phenomena of nature, notwithstanding their complexity and appparent confusion, is rendered possible by the processes of analysis and synthesis which are the foundation of all Scientific Methods". The earliest and simplest method of discovering order in a confused mass of data is by classification. Classification, the first step in the analysis of data, means arranging data in different classes or groups according to their similarities or dissimilarities. The mass of data may be similar or dissimilar. They are arranged or grouped together on the basis of these similarities or dissimilarities which are pertinent to the hypothesis.

When the data has been classified it is to be put in proper form. If the data is statistical in form it has to be placed in the form of tables in order to facilitate comparison. Again if the data is in a numerical form various measurements like averages, percentages etc will have to be completed for the sake of comparison. The elements obtained by analysis of different objects or events may also be synthesized in such a way so as to form combinations, the likes of which have never been observed at all.

Generalisation

The last step in the scientific method of research is generalisation or drawing of inference. After collecting, analysing and processing the data, broad conclusions are drawn which may be later used for the purpose of deduction. This method can be broadly classified into two groups : Logical Methods and Statistical Methods.

Logical Methods

The important logical methods frequently used to draw inferences are: Method of agreement, Method of difference, Joint method including methods of agreement and difference both, Method of residues, Method of concomitant variation etc. All these methods are basically logical processes to draw inferences. *The method of agreement* may either be positive or negative. In the positive method when two or more cases of a given phenomenon have one and only one condition in common, then that condition may be regarded as the cause (or effect) of the phenomenon. In negative cases the absence of a particular condition is regarded as the cause (or effect) of the phenomenon Symbolically it may be expressed as :

Positive case

A + B + C — Produce — X

C + D + E — Produce — X

Therefore C — Produces — X

Negative case

A + B + non C — Produce — Non X

Non C + D + E — Produce — Non X

Therefore C — Produces — X

The method of difference is a combination of both positive and negative methods of agreement. In this method, all other factors being common, when the presence of a factor is associated with the presence of another factor, or the absence of it, the factor may be said to be causally connected. Symbolically it may be represented as :

A + B + C — Produce — X

A + B + Non C — Produce — Non X

Therefore C — Produces — X

The joint method for drawing inference is an amalgamation of the methods of agreement and difference. According to this method, if two or more causes in which a phenomenon occurs have something in common, others in which the phenomenon does not occurs have all other things in common except the cause or effect on the phenomena. The first part of this method is the method of agreement while the second is the method of difference. Symbolically it may be presented as :

A + B + C — Produce — X

A + P + Q — Produce — X

M + N + non A — Produce — non X

G + H + non A — Produce — non X

Inference : A and X are causally connected.

The method of residues is that if a phenomenon occurs under certain circumstances and it is known on the basis of previous knowledge that a part of phenomena is causally connected with some of the circumstances then it will be assumed that the remaining phenomena are also causally connected with the remaining circumstances. The discovery of the Planet Neptune was made in this way. It was seen several times that Uranus deviated from its path. People tried to ascertain its cause, but in the absence of any valid cause it was thought that this could be another planet. This led to the discovery of Neptune. This method, however, was first of all used by Sir John Herschel, an astronomer of the 18th century. In this method previous knowledge of a phenomenon and its causative factors are essential and it is on the basis of these factors that we proceed to predict the phenomenon. If the actual results differ from the predicted results we try to find out particular circumstances which cause the difference. Symbolically this method can be represented as :

A B C D — Produce — W X Y Z

B C D — Produce — X Y Z

Therefore A — Produces — W

The method of concomitant variation is also known as method of quantitative induction as we base our inference on quantitative change in the two factors. In this method the inference is based upon the change in the two inter-related factors. If the change in two factors is in the same direction and an increase in one is followed by an increase in the other and a fall by decrease, the two factors may said to be causally connected.

These logical methods are however, sometimes unreliable due to plurality of causes and inter mixture of effects. The statistical method of drawing inferences tries to solve this problem.

Statistical Methods

The statistical methods are mathematical in nature. In addition to establishing a causal connection between two variables these also try to establish a mathematical relationship between them. As for example, it is not enough to say that poverty causes delinquency. These methods also try to find out a numerical measurement of the extent of this relationship. Co-existence or co-variance of two or more variables can at best be proved by statistical methods. But they can never differentiate between the cause and effect, nor can they ascertain why a particular factor produces a certain result. Thus in these methods too, early part of the inference is similar to that of the logical methods. The only advantage of the statistical methods is that these can prove the degree of co-variance.

To sum up, conceiving a proper hypothesis is the first and most important step to begin a research, whatever be the process i.e. from general to specific or vice-versa. The formulated hypothesis is tested by collecting and analysing pertinent data or by the systematic observation of facts. And lastly the hypothesis is verified. Logical or statistical methods may be used for this purpose. It should be noted that the two methods are not mutually exclusive. Sometimes, for a correct inference, both methods may be necessary. If, in a research process, the hypothesis is not fully proved, it may be amended and a fresh hypothesis adopted. This process should go on till a perfect hypothesis has been evolved which can stand all the tests.

TO OUR READERS

Knowledgeable and perceptive as they are, our contributors must not necessarily be allowed to have the last word. It is for you, the readers, to join issues with them. Our columns are as much open to you as to our contributors. Your communication should, however, be brief and to the point.

The Purpose of Legal Education

Justice J.S. Verma, the then Chief Justice of India, delivered the Convocation Address at first convocation of the faculty of Law as a part of the 79th and 80th convocation of the Banaras Hindu University. He said, "The essential purpose of legal education is to prepare every member of the legal profession to discharge his role in the administration of justice. The true function and purpose of administration of justice is to enforce and maintain the values in the society and respect for the Rule of Law. Governance by Rule of Law is the essence of democracy. Administration of Justice must ensure its preservation." Excerpts

Success in the future has broadly three aspects · **Personal; Professional; and National.** The first aim of everyone is to achieve personal excellence. However, that should not be the only aim. It is true that personal excellence automatically brings professional excellence which in turn transcends to excellence at the national level. It then contributes to the national wealth. Human resources are the richest asset of a Nation and every individual who achieves excellence thereby contributes to the augmentation of the national assets. Make every effort to increase the worth of human resources in the country. To achieve this end, it is necessary to become first, a good human-being because without being a good human-being, you cannot in the true sense be a good professional.

The level of spiritual, ethical and cultural values determine the degree of civilisation of a society. Education is an effective tool for inculcating values. The significance of values in the Nation determine course of its history. The decline and fall of the Roman Empire of ancient glory is attributed to the fall in the values in the society. Real education must guard against diminution of these values. In the zeal for fast forward movement by adopting the western mode, we must not forget our own unique cultural values which have developed through the centuries. Varanasi is a constant reminder of these values. The Indian ethos is based on values, not on materialism alone. That is why the greatest respect in Indian society has always been given to those who renounced and not to those who were engaged in the quest for material gains Mahatma Gandhi renounced materialism, and is called the Father of the Nation. Pt. Madan Mohan Malviya was another such person to whom Banaras Hindu University owes its creation. The objective of an educational system must be to inculcate these values and to promote these ideals The values of compassion for human-beings and all living-beings forms part of the Indian ethos.

The values are best inculcated by practice and not mere preaching. Each one of you would be the nucleus of a family. You must, therefore, practice proper values so that each member of your family imbibes them and in turn these values multiply. The education of a child begins at birth and the greatest impact is made by the atmosphere in which the child grows. The values which you practice would determine the values of your family.

Education is not mere literacy but the development of full personality as an aware and cultured person. The purpose of University education is to achieve this end. The purpose of higher education is indicated, thus :

> "As society becomes more and more complex, the institutions are pressed to assume social obligations — to train for employment, to solve social problems, to help set ethical directions for society. The purposes of higher education are several fold. They are concerned with student growth and development, the discovery and refinement of knowledge, and social impacts on the community. But all of the programmes should be oriented to a central purpose."
>
> ('*Higher Education in America*' by Aglo D Henderson & Jean Glidden Henderson.)

Report of the "International Symposium and Round Table", UNESCO, 1990 on *Learning to Care : Education for the Twenty-first Century* emphasised some of the aspects for a desirable education system and stated the problem as one of participation in creating a more equitable, fairer and more liveable world in the twenty-first century. This will be addressed only when we become more caring. The report emphasised the need to pay attention to many aspects of caring: "Caring for oneself, including one's health; Caring for one's family, friends and peers, Caring for other people; Caring for the social, economic and ecological welfare of one's society and nation; Caring for human rights; Caring for other species; Caring for the liveability of the earth; Caring for truth, knowledge and learning."

Today, education must help realise the needs and ideals of the society. Government must transform itself into an agency of society from its role as an instrument of power. These ideals thus become the aims of education. Today, civilisation is becoming increas-

ingly complex. Society's structures are complex.

In the fast changing conspectus with the impact of modern technology, the opportunities open to the modern youth are tremendous. Today's education must prepare the students to adjust to these great changes and challenges. Care must be taken that the modern lifestyles and work-styles are not divorced from the rich cultural heritage which must always remain the core value of your life. It is only with the core value of culture that you can adopt the change without being swayed. The dehumanising dimension of technology has to be counter balanced by the moral values. In the journey through life, the core value will keep you on even course in the constant pursuit of the objective.

With these remarks of general application, I must now refer to the aspects peculiar to the legal profession. You are now at the threshold of the legal profession, which is a noble profession. The essential purpose of legal education is to prepare every member of the legal profession to discharge his role in the administration of justice. The true function and purpose of administration of justice is to enforce and maintain the values in the society and respect for the Rule of Law. Governance by Rule of Law is the essence of democracy. Administration of Justice must ensure its preservation.

Rule of Law is a dynamic concept and must keep pace with the changes to suit the current needs of the society. Protection of Human Rights and implementation of the legal framework is essential to prevent resort to rebellion against tyranny and oppression. In the *Act of Athens, 1955*, the Rule of Law is described as springing "from the rights of the individual developed through history in the age-old struggle of mankind for freedom; which rights include freedom of speech, press, worship, assembly and association and the right to free elections to the end that laws are enacted by the duly elected representatives of the people and afford equal protection to all."

This description of Rule of Law by the International Commission of Jurists is universally accepted and is a general definition in conformity with the legal system in every democracy. The first prerequisite of justice, is Rule of Law and the true role of the legal profession is to endeavour to equate law with justice to achieve the ideal form of administration of justice. Court of Law is described as 'Temple of Justice'. The Judges and Lawyers who constitute the legal profession discharge the role of priests in the Temple of Justice to worship the idol of justice.

This being the true role of the legal profession, each member of the profession must be well equipped to perform this function by developing the personality needed for the role Legal Education must not be confined merely to the knowledge of the letter of the law but also extend to discovery of its spirit and ability to project the same. It is the moral content of the law which equates law with justice. Emphasis on legal ethics is imperative. Sir Maurice Gwyer, former Chief Justice of India in the Foreword to *Professional Conduct and Advocacy* by K.V. Krishnaswami Aiyar, said :

> "'Every member of the Bar is a trustee for the honour and prestige of the profession as a whole'. The student or young advocate who reads this book will learn why that is so. He will also understand better than he did before that the law is a great and noble profession, whatever its critics may say, and law itself a great and noble science, the king of kings, as the sacred books of this country call it; and he will, I hope, determine that never by any act or word of his will he show himself unworthy of the great tradition which he has inherited."

I would, therefore, lay great emphasis on the understanding and practice of the ethics of the legal profession without which a lawyer cannot truly discharge his role as a member of the profession.

The dispensation of justice being a divine function, the traits necessary in the Judges who undertake this role have been indicated in the ancient texts, thus :

"राजा तु धार्मिकान् सम्यान् नियुन्ज्यात् सुपरोक्षितान्
व्यवहार धुरं वोढ़ं ये शक्ता: सद्भावा इव
धर्मशास्त्रार्थ कुशला: कुलीना: सत्यवादिन:
समा: शत्रो च मित्रे च नृपते स्यु: सभासद:"

"Let the King appoint, as members of the Courts of Justice, honourable men of proven integrity, who are able to bear the burden of administration of Justice and who are well versed in the sacred laws, rules of prudence, who are noble and impartial towards friends or foes."

It is necessary that legal education must inculcate in each member of the legal profession these traits and values. Then only the real objective of administration of justice can be achieved.

Certain basic principles governing the conduct of Lawyers and Judges need mention. Independence of Judiciary is basic to Rule of Law. An Independent Judiciary means not merely independent Judges but also independent lawyers. It is their duty to ensure impartial justice in every cause achieved by judicial proceedings conducted fairly. Every member of the profession must conduct himself in such a manner as to pre-

serve the dignity of the profession and impartiality and Independence of the Judiciary. The protection of the Human Rights and fundamental freedoms guaranteed in the Constitution is primarily the responsibility of the legal profession. For this purpose, access to justice must be real. This is possible only when the lawyers make their services available for reasonable fees and do not convert the profession into a business. They are the essential agents of administration of justice. Members of the legal profession were in the forefront of the freedom struggle. Their responsibility is no less now since the preservation of freedom and ensuring governance by Rule of Law has now to be their prime concern. A credible system of administration of justice is essential for preservation of proper values in the society, liberty, and life of every individual with dignity.

Mere awareness of the fundamental rights guaranteed in the Constitution to every citizen is not enough. Awareness is needed also of the Directive Principles of State Policy to effectively discharge the participatory role in governance through a representative Government. It is needed to oversee the functioning of the democracy by exercise of informed choice in the selection of peoples' representatives through whom there is governance. The fundamental duties in Article 51A of the Constitution of India are of great significance. These must form part of the education from the very beginning. They contain the basics of civic duty of every citizen. Fundamental duties are comprehensive, and rigidly observed, as they are meant to be, by every citizen, their cumulative effect is to elevate the status of individual to great heights of human behaviour. Translated into reality, every citizen of the country observing these fundamental duties would augment the human resources of the Nation to unbelievable extent, and, thereby, make India the richest Nation. That should be the endeavour of each one of you. If you can achieve this result, the true purpose of education would be served.

Law is an instrument of change, to realise its vision. The focus of the ideals set out in the Preamble and the constitutional mandate for governance in the Directive Principles (Part IV) have been realised by reading them in the meaning of the Fundamental Rights (Part III) to make them enforceable. The dream of a Welfare State and the true concept of Equality, Liberty and Justice for all are becoming real through the medium of law enforcement. Probity in public life and accountability of holders of public offices, to promote the concept of Equality has become possible through the instrument of Law. The principle of Sustainable Development based on the doctrine of Trust for a better and healthy world is being enforced by the means of Law. The vast expanse of the field of Law and the promise it holds to improve the world order is the challenge before you. Work to realise the full potential available to the youth. Shape of the future is in your hands.

A perceptive article under the heading "New, Quiet Revolution On The Way" has projected a thought for serious reflection. It says :

> "An academic community with a sense of mission can achieve something of importance even with scanty material support. One that has lost that faith finds excuses for non-performance in lack of material incentives while in reality no increase in such incentives can, in that moral vacuum, produce any substantial improvement in performance..."

In life's struggle during all competitions it is useful to remember :

> *"You will never get ahead of any one as long as you are trying to get even with him."*
>
> ***—Seneca***

I would conclude with the words of wisdom of Stephen Grellet :

"I shall pass through this world but once. If, therefore, there be any kindness I can show or any good thing I can do, let me do it now; let me not defer it or neglect it, for I shall not pass this way again."

Identity Crisis of LIS Profession

A Colloquium on "Identity Crisis of Library and Information Science Profession" was recently organized by Ahmedabad Library Network, Gujarat University Department of Library & Information Science and INFLIBNET Centre at Ahmedabad. The thrust was on identifying new opportunities; the challenges to overcome to take the opportunities and defining new role and work which gave identity.

Shri Kartikeya Sarabhai, Chairman, ADINET, in his presidential address, emphasized the importance of time environment which we needed to move. He said it was not only what we would do but we should also decide how fast we would do. His focus was on proacting with visionary plans and making services available within minimum response time Prof. K.S. Shastri, Pro-Vice-Chancellor of Gujarat University, who inaugurated the Meet, stressed the importance of shifting the wanted information through the massive information giving one of the reasons of identity crisis. He said we should develop knowledge and conceptual ability proportionally to technology development. Dr. Vidyut Joshi, Vice Chancellor of Bhavnagar University, in his keynote address, emphasized the whole panorama of paradigm shift in Library & Information Science saying crisis would go away, identity would remain.

The Colloquium was organised in two sessions. Shri Kirit Vyas, Librarian, Bhavnagar University, gave the overview of traditional librarianship and said that unlike earlier when libraries had "museum value now libraries are agencies of mass communication and an important source of social emancipation." Dr. A.R. Dasgupta of the Space Application Centre, talking about the trends and issues in the information services said, "Information service providers have to master several technologies to be effective. The age of specialization is here and information service providers have to address niche users to be more effective."

Dr. Jajoo, Professor, IIM, talking on impact of telecommunication, technologies in Information Services said, "If you missed the paradigm of web-server and web-browser let me tell you, you would really be into identity crisis". The speakers identified the areas where the professional role and work should be focused.

Ms. Harsha Parekh, Professor of Library Science & University Librarian, SNDT Women's University, Mumbai, telescoping in "Identity of the Information Profession : Towards Extinction, Adaptation or Genetic Drift" talked about the concept of "identity" in general and of identity of the information profession in particular — its role and functions.

Quoting D.A. Lewis, who said "By year 2000 today's information worker will have no identity, a forgotten image, and a negative potential" Ms. Parekh said if extinction was to be avoided, conscious efforts must be made to adapt to a new role. The addition of new information packages and services, the acquisition of new skills would help. The genetic drift would give rise to four sectors i.e. (1) Absorption into line function, (2) Facility Provider, (3) Archival Role, and (4) Integrated Information Centre (IIC).

Mr. P.C. Shah former Assistant Director and Head, NICTAS, ATIRA, Ahmedabad talking about 'Entrepreneurship Amongst Library and Information Professionals — A need of the Day', said there was definitely a crisis in Library and Information (L & I) Profession, and this was because "a majority of the L & I Centres are unable to satisfy their users' needs up to a satisfactory level." He said that crisis was in two areas, one related to manpower and other related to technology. He said that there were also some severe restrictions under which L & I professionals were working and there was government support to public libraries in bare minimum. The education and examination systems in our country too did not encourage library use.

Mrs. Daksha Surati, Coordinator, Dept. of L & I Science, Gujarat University talking on 'Emerging Information Society Cause of Emerging Information Industry' said that Information Industry, comprised on Information Content Industry, Information Delivery Industry and Information Procession Industry. The need of the hour was to give highest priority to Information sector within the economy, just as we gave priority to industrial sector, etc. Mr. V.W. Karnik, Librarian, British Library, Ahmedabad and Dr. Dilip Ahalpara, Head, Computer Centre IPR shared their experiences of Impact of network on Library and Impact of Internet on Information services respectively.

Ms. Harshaben Parekh concluded by saying that adaptation to a new role and a new identity

took into accounting changing role. To achieve this, responsibilities of changes lay with creating new identity shared between individual professionals, the departments, the institutions i.e. the employers & professionals' associations.

Awards for Innovative Inventions

The National Research Development Corporation recently announced this year's Republic Day awards for innovative inventions under its Invention Promotion Programme. Four teams of scientists who have won the awards include Prof. V. Radhakrishnan and Dr. R. Jagannathan of the Indian Institute of Technology, Chennai; Dr. Subrata Pal, Dr. T.K. Pal, and Dr. Anjana Pal of Jadavpur University, Calcutta; Prof. Yash Pal Singh and Prof. V.G Rau of IIT, Kharagpur; and Mr. I. Srinivas, Mr. R. Sudhakar and Dr. K. Nagarajan of the Central Tobacco Research Institute, Rajahmundhry.

Prof. Radhakrishnan and Dr. Jagannathan have won the highest award, carrying a cash prize of Rs. 75,000, for developing a fluidised abrasive machine for polishing. The machine can be used for polishing of sculptured surfaces, which are, otherwise, not amenable to machine polishing and the applications include polishing of diamonds, magnetic heads, ceramic products, turbine blade surfaces and die cavities.

Dr. Subrata Pal, Dr. T.K. Pal and Dr. Anjana Pal have bagged an award of Rs. 50,000 for the development of a hydroxyapatite-coated titanium implant for single tooth replacement, by a screw form dental impact suitable for screwing into jaw bones in the toothless area for permanent anchorage.

Prof. Yash Pal Singh and Dr. Rau have won the award, carrying a cash of Rs. 10,000, for a clock-controlled sun tracking mechanism for maximising energy collection of a photovoltaic panel or a solar thermal collector. The mechanism uses a counterweight whose release rate is governed by the escape mechanism of a conventional alarm clock. The device tracks within 0.5 degree throughout the day.

The fourth team, consisting of Mr. Srinivas, Mr. Sudhakar and Dr. Nagarajan have won the award, with a cash prize of Rs. 10,000, for the development of a machine for the separation of palmyrah fibres, which are used to manufacture high quality brushes for vacuum road cleaners, acoustic boards, household brooms, cushions and other applications. The fibre, a significant amount of which is exported, is presently being separated manually by beating with iron rods. It has become a rural-based cottage industry covering some parts of Tamil Nadu, and Kerala and the coastal districts of Andhra Pradesh.

Unesco Chairs

The United Nations Education Scientific and Cultural Organisation (UNESCO) Director General, Mr. Federico Mayor, announced the institution of four "rotational chairs" on Social Anthropology, Bio-technology, Medicinal Plants, and Cultural Identity for the Indian universities. Two international institutes on technical and vocational education, and water management would also to be set up.

He said they would be known as "Unesco chairs". Instituting these would help dissemination of relevant education through the distant learning medium. The two vocational educational centres would cater to the requirements of the disabled persons. One special chair on culture is already operating in the Indira Gandhi Centre for Art and Culture.

Mr. Mayor also called on Prime Minister Mr. I.K. Gujral and Human Resource Development Minister Mr. S.R. Bommai and expressed his desire to set up a World Commission on Communications and Culture with India as it chairman.

He requested India to chair the panel on cultural heritage at the world conference on culture in Sweden, being organised jointly by the Unesco and the Swedish government.

Human Genetics Research at GNDU

Guru Nanak Dev University is reported to have received a Rs. 1.75 crore project for research in human genetics jointly approved by the Governments of India and Germany. According to the Vice-Chancellor, Dr. H.S. Soch, 19 scientists from various states of India and 16 scientists from institutions of human genetics will work on the project at the Centre for Genetics Disorder. Facilities are to be established for linkage analyses of diseases causing gene utilising microsatellites. Physicians as well as scientists will be trained in India and Germany for the identification of genetic diseases and in the latest techniques of molecular genetic.

Dr. Manfred Stassen, Director, German Academic Exchange service, recently visited the university to explore possibilities of academic interaction between this university and German universities on a permanent-footing. Different exchange programmes available for the faculty and students were highlighted by Dr. Stassen. The

university will soon sign memorandums of understanding with two US universities — Wisconsin University and Lake Heaven University — for bilateral exchange of faculty and students. The university will grant affiliation to colleges outside Punjab and India for teaching of Punjabi. Handsworth College, Birmingham, has already been granted affiliation for this purpose.

IUCAA Regional Centres

The Inter-University Centre for Astronomy and Astrophysics (IUCAA) proposes to set up a number of Regional Centres in some universities/colleges as a step forward in its primary objective in reaching out to universities for promotion of Astronomy and Astrophysics. The aim will be to make available some library, computing and communication facilities to university and college teachers and students, reasonably close to their place of work, so that they can continue working on projects in Astronomy & Astrophysics which they have initiated at IUCAA. The Regional Centres will also provide an avenue for discussions with like minded colleagues As an initial step, three or four centres will be set up in different parts/regions of India. It is expected that the Centres will start functioning from October 1, 1998.

The IUCAA will provide (i) a certain number of important books, and about half a dozen journals, relevant to the activities of the specific Regional Centres. This will be provided as a long term loan to be used by visitors to the Centre; and (ii) travel support to visitors from the region covered by the Regional Centre. It is expected that visitors will generally have to travel only for short distances and will remain at the Regional Centre for short periods.

The host university/college will have to provide infrastructural support i.e. a furnished office for use by visitors; an area for display and storage of books to which visitors would have free access; some computing facility for use by the visitors; E-mail connectivity; and accommodation to visitors to the Centre.

IUCAA invites applications from interested persons who would like to set up a Regional Centre in their university department or college. The application should provide adequate information on (i) Facilities which could be provided by the host institution; (ii) Research areas which would form the core activities of the Centre; and (iii) Tentative list of scientists (name, affiliation, qualification and research interest) who have expressed an interest in using the facilities in their Centre.

Applications forwarded through the University Vice-Chancellor or College Principal should reach the Coordinator, Core Programmes, IUCAA, Post-Bag 4, Ganeshkhind, Pune-411 007 by June 1, 1998.

Research Endowment Prizes in Physics

The Sardar Patel University invites outstanding original research work of merit from researchers of Universities/Institutes deemed as Universities/Institutes of National Level for the award of "Hari Om Ashram Prerit Shri Harivallabhadas Chunilal Shah Research Endowment" prizes in the subject of "Physics".

The award carries a cash prize and a Gold Medal, both amounting to Rs. 10,000/-. The number of research papers (published/unpublished) to be submitted for the competition is not restricted for a researcher. Four sets of the each of the research paper may be sent. The research work to be submitted by a researcher should have been carried out during 1993 to 1997. The language of the research papers must be English

The last date for receipt of entries is 31st March, 1998. Further details may be obtained from Mr. K.M. Patel, Registrar, Sardar Patel University, Vallabh Vidyanagar-388 120.

News from Agricultural Universities

CCSHAU Founder's Day

CCS Haryana Agricultural University (CCSHAU) had intensified research in value added crops alongwith traditional crops and also reoriented its academic curricula. These steps had been initiated to meet the challenge of food requirement of the teeming population and help farmers in getting maximum returns, said Prof. J.B. Chowdhury, Vice-Chancellor in Hisar on the eve of the Founder's Day of the University.

He said that demand as well as marketing scenario of fruits, vegetables and flowers was poised for a drastic change in the years to come, hence research thrust was being laid on these crops besides traditional crops of wheat, rice, cotton, gram, mustard, fodders and many others. Likewise, course curricula for various degree programmes had been revitalised and some new postgraduate degree programmes like M.Sc. degree in bio-technology, food science and technology, fisheries and Master of Business Administration with specialization in agricultural market-

ing had been introduced in view of producing a technical work force that could efficiently tackle the agricultural situation and make farmers earn more profit out of their produce.

He said the scientists of the university had been successful in developing hybrids of cotton, bajra and guava. However work on identifying hybrids of okra (*bhindi*), tomato, bittergourd, rice and maize was in the advance stage. Apart from possessing high yield potential and resistance to various diseases and pests, these hybrids were qualitatively superior to the existing varieties, he added.

Spelling out recent achievements, he said that breakthrough in embryo transfer technology (ETT) and tissue culture techniques had been achieved by the scientists of the university. Through these techniques they had produced a calf of Hariana breed of cattle and many plants and tree species of economic value, respectively.

In view of the excessive role being played by the rural women in agriculture and livestock rearing, the university had also initiated measures to give them exposure to the latest techniques which besides being time and energy saving were helpful to shed their drudgeries.

Prof. Chowdhury said that the university had also focused attention on resistance breeding, genetic engineering, integrated pest control and checking salinity and alkaline level in soil. In some situations, he said efforts were being made for improving the input efficiency in different cropping systems.

Besides, the university had been making efforts to upgrade the capabilities of the existing personnel to enable them to perform new and complex tasks through the Academy of Agricultural Research and Education Management (AAREM) established at the university under a World Bank project. The Academy had emerged as a premier training institute as it had started attracting participation from both within and outside the country.

The Vice-Chancellor said an ambitious project to link the university through internet with other agricultural universities in the country and important laboratories and libraries of the world was under progress with the financial assistance of Rs. 3 crores from the World Bank, ICAR and the Haryana Government. In the first phase, the entire campus extending over 2500 acres and all its substations located at 15 district headquarters and two of its outstation campuses would be connected through computers and networking. However, later this facility would be extended to villages to have direct contact with the farmers of the state.

News from UGC

Countrywide Classroom Programme

Between 22nd and 28th February, 1998 the following schedule of telecast on higher education through INSAT-1D under the auspices of the University Grants Commission will be observed. The programmes are telecast on the Doordarshan's National Network from 7.15 to 8.00 a.m. every day except on Saturdays & Sundays. These programmes are also telecast on Doordarshan's National Network from 6.00 to 7.00 a.m. four days a week i.e. on Tuesdays, Thursdays, Saturdays and Sundays. On DD2 University Video Lecture Courses will be shown at midnight between 0000-0030 hrs. and in the morning between 10-10.30 a.m. on Monday through Friday.

Hindi Programmes are being telecast on Mondays, Wednesdays & Fridays from 6.00 to 6.30 a.m.

22.2.98

"Kuchamani Khayal — Composer Kavi Lachiram"
"Hand Made Paper"
"Nadine Godimer"

UVLC

No Telecast

23.2.98

"Little Knowledge is a Dangerous Thing-2"
"Arms & the Man-1 : Bernard Shaw"
"Physics of Thermoluminescence"
"Rain, Rain Come Again"
"Bronchial Asthma"

UVLC

"Jainism and Buddhism : A Survey of their History & Main Principles"
"Endocrine & Hormonal Integration"

24.2.98

"Material Testing-1"
"Heritage of Thanjavur — Saraswati Mahal"
"Kidney Stone"
"Tackling a Landslide"
"Arms & the Man-2 : Bernard Shaw"
"Oxygen-2 : Vital Yet Deadly"
"It Moves, It's Alive"
"How Indian is English-2"

UVLC

"Ethical Neutrality"
"Elementary Integration and Applications-II"

(Contd. on page 20)

Population Environment Dynamics — 2

	Population (millions) mid-1997	Natural increase (annual, %)	Projected Population (millions) 2025	Deaths under Age 5 per 1,000 children 1995	Per cent under Age 5 under weight 1990-96	Annual Renewable Fresh Water Available per capita (cubic meters) 1990	2025	Per cent with access to safe water 1990-96	Per cent with adequate sanitation 1990-95	Cropland available per capita (hectares) 1990	2025	PPP per capita[1] (int'l $) 1995	CO_2 emissions per capita (metric tons) 1992
World	5,840	1.5	8,036	70	—	9,255	5,896	—	—	0.26	0.16	6,045	3.8
Africa	743	2.6	1,313	145	26	5,532	2,386	56	46	0.29	0.13	1,961	1.3
Algeria	29.8	2.4	47.7	61	13	690	378	78	91	0.31	0.17	5,300	3.0
Angola	11.6	3.2	25.5	292	—	17,185	5,936	32	16	0.37	0.13	1,310	0.5
Botswana	1.5	2.6	1.6	52	15[2]	14,107	6,040	93[2]	55	1.08	0.46	5,580	4.0
Burkina Faso	10.9	3.0	18.0	164	30	3,116	1,293	78	18	0.40	0.16	780	0.1
Cameroon	13.9	2.8	28.5	106	14	18,046	7,130	50	50	0.61	0.24	2,110	0.2
Chad	7.0	2.5	13.2	152	—	6,843	2,944	24	21	0.58	0.25	700	0.0
Cote d'Ivoire	15.0	2.6	26.5	150	24	6,180	2,010	75	43	0.31	0.10	1,580	0.5
Dem. Rep. of Congo	47.4	3.4	104.3	185	34	27,220	9,738	42	18	0.21	0.08	490	—
Egypt	64.8	2.1	97.6	51	9	1,046	605	79	32	0.05	0.03	3,820	1.5
Ethiopia	58.7	2.8	112.0	195	48	2,320	867	25	19	0.29	0.11	450	0.1
Ghana	18.1	2.9	28.2	130	27	3,529	1,395	65	55	0.18	0.07	1,990	0.2
Guinea	7.5	2.4	13.1	219	26	39,270	14,979	55	21	0.13	0.05	—	0.2
Kenya	28.8	2.6	36.0	90	23	635	237	53	77	0.10	0.04	1,380	0.2
Madagascar	14.1	3.3	29.3	164	34	3,182	1,162	29	3	0.25	0.09	640	0.1
Mali	9.9	3.0	23.7	210	31[2]	6,730	2,523	45	31	0.23	0.09	550	0.0
Morocco	28.2	2.0	39.9	75	9	1,151	689	55	41	0.38	0.23	3,340	1.1
Mozambique	18.4	2.7	33.8	275	27	4,088	1,651	63	54	0.22	0.09	810	0.1
Niger	9.8	3.4	22.4	320	36	5,691	1,966	54	15	0.47	0.16	750	0.1
Nigeria	107.1	3.0	231.6	191	36	3,203	1,292	51	58	0.34	0.14	1,220	0.9
Rwanda	7.7	1.9	11.7	139	29	902	399	—	—	0.17	0.07	540	0.1
Senegal	8.8	2.7	16.9	110	20	4,777	2,071	52	58	0.32	0.14	1,780	0.4
South Africa	42.5	1.5	45.5	67	9	1,349	705	99	53	0.36	0.19	5,030	7.5
Sudan	27.9	2.1	46.9	115	34	4,913	2,069	60	22	0.52	0.22	—	—
Tanzania	29.5	3.0	42.6	160	29	2,969	1,208	38	86	0.13	0.05	640[2]	0.1
Tunisia	9.3	1.9	13.5	37	9	540	328	98	80	0.60	0.37	5,000	5.9
Uganda	20.6	2.9	33.5	185	23[2]	3,677	1,373	38	64	0.37	0.14	1,470	0.1
Zambia	9.4	2.1	14.1	203	28	11,779	5,018	27	64	0.65	0.28	930	0.3
Zimbabwe	11.4	2.7	11.3	74	16	2,323	1,172	77	66	0.28	0.14	2,030	1.8[2]

Notes : 1. PPP Per capita . Purchasing Power Parity per capita is an estimate of a country's gross national product (GNP) per person. The estimates are converted to international dollar by adjusting for the buying power of the country's currency.

2. Data collected from a year or period other than the one listed; differ from the standard definition; or refer to only one part of a country.

Source : Population Reference Bureau, 1875 Connecticut Ave., NW, Suite 520, Washington, DC 20009 USA.

(Contd. from page 17)

25.2.98

"Much More than Meets the Eye"
"Staging Beckett"
"Paleo Climate-2 : An Indian Perspective"
"The Hindu Temple Sikhara-2"
"Insect Migration"
UVLC
"Planning the Home"
"Currents of the Ocean-1"

26.2.98

"Digital Communiction"
"Integral Pedagogy Process-4 : Reflection"
"Ways of Seeing — Alternative Literature in the Early 19th Century"
"Question Time-55"
"Waiting for Godot-1"
"Bulls' Eye & Bear Facts"
"Visual Impairment : Mobility"
"Vedanthangal" Winter Heaven for Birds"
UVLC
"The Indian Republic as a System"
"Subsidies-2"

27.2.98

"Profile"
"Waiting for Godot-2"
"Jazz-2"
"Careers in Telly Wood"
"The Fashion Business"
UVLC
"Creative Thinking"
"Investigations"

28.2.98

"Fibonacci Numbers-2"
"The Dominant Tradition"
"C.V. Raman"
UVLC
No Telecast

Hindi Telecast

प्रात: 6.00 से 6.30 बजे तक

23.2.98

"आपका स्वास्थ्य, आपके हाथ-1"

25.2.98

"ग्रंथालय और कंप्यूटरीकरण"

27.2.98

"द्वाराहाट के प्राचीन मंदिर"

News from AICTE

Visiting Professorship

AICTE scheme of Visiting Professorship supplements and provides expertise to teaching and research in the areas which are important but in which the host institution does not have the expertise.

A Visiting Professor shall be an eminent scholar in his field, is in the rank of a Professor or equivalent level and is an expert in a research or professional organisation.

The maximum tenure of appointment of a Visiting Professor from within the country shall be one year and the minimum not less than three months. The tenure of a person appointed as a Visiting Professor from abroad shall not be less than two weeks and not more than three months.

A Visiting Professor from within the country shall be paid travel expenses in accordance with the rules of the University limited to 'Y' class by air. He/she would be entitled to lumpsum honorarium equivalent to 50% of the maximum basic pay of a Professor. Besides a lumpsum of Rs. 11,200/- per month for other expenses. Persons from outside India shall be paid a daily allowance not exceeding Rs. 500.00 per day for visits up to one month besides travel expenses to the maximum of three places to visit other universities, institutions to deliver extramural/state of the art lectures. No International Travel Fare shall, however, be payable.

Postgraduate colleges and institutions affiliated to a university should apply for the appointment of Visiting Professor to AICTE through the university with which the college/institution is affiliated. National or regional technical education institutions like IIMs, IITs, RECs and universities should apply directly to AICTE.

The host institution/university/department would submit proposals of candidates keeping in view the AICTE guidelines for visiting professorship accompanied with a detailed Bio-data of the candidate.

The universities, IIMs/IITs/RECs would however, appoint a three member committee nominated by the Vice-Chancellor/Director to consider/invite a Visiting Professor and make recommendations to AICTE.

Seminar Grant

The scheme of Seminar Grant provides financial assistance to institutions for organizing symposium/workshop/seminar at national and international levels in various fields of technical education. It promotes high standards in technical education by way of extending opportunities to the academics and working professionals by providing a forum for sharing their knowledge, experience, innovations and inventions. Preference is given to topics of interdisciplinary nature, emerging and thrust areas in technical education. To promote organization of such activities the Council has decided that the proposals should reach the Council well before the dates of Seminar and not latest by six months as earlier.

BOOK REVIEW

An Educative Experience

B.S. Dagar*

R.P. Singh. Educaton and The Indian National Congress (1885-1947) : Myths, Reality and Resolutions. New Delhi, Scenario Publications, 1996. Pp. 284. Rs. 495/-.

Undertaken as a research project financed by ICSSR by a superannuated professor of NCERT affiliated to Nehru Memorial Musuem and Library, the present publication is the printed version of the report on the subject stated above. It is the first ever study which contains a historical analysis of the role the Indian National Congress (INC) played in the growth and development of education in pre-Independent India. In the process of study, numerous relatively unknown facts have come to light and it is these facts which make this book at once both interesting and shocking — interesting because they reveal the actual background of the commonly known events and shocking because we have generally missed the actual perspective.

For example, the INC ever since its inception has had to face three challenges — from the muslims, the pro-changers (i.e. the radicals) from within its own ranks and the hostile, alien administration. No matter what step the INC ever wished to take the Muslims were first to oppose. Being a conglomerate of divergent interests and people, its actions nearly always lacked the punch they could otherwise must have possessed had the reality been any different.

In spite of having been dubbed 'Hindu' party by muslims in India, it had always been critical of the hindus or their welfare activities. Excerpts from books like *Indua Divided* by Rajendra Prasad and *The Congress Ideology and Programme* by P.D. Kaushik and others bring this point to the fore.

The much touted Basic Education of Mahatma Gandhi and the report prepared by Zakir Husain stand analysed to reveal unknown facts just as the wailing of being a backward community by muslims has been furnished an objective perspective comparable to the aftermath of sikh rule for the sikhs and christian rule for the local christians after 1947.

The other facts that have come out are that INC passed only 25 resolutions on education between the years 1885-1947, that it failed to acknowledge its major source for 1906 Resolution on National Education, and its own President of 1887 denied India being a Nation in his presidential address.

It is one book which could easily be called an educative experiene. Considering the explosive elements it possesses the book is not priced adequately enough.

*Department of Education, Maharshi Dayanand University, Rohtak.

PANJAB UNIVERSITY, CHANDIGARH

COMMON ENTRANCE TEST (C.E.T.)

FOR ADMISSION TO B.E./B.ARCH./B.E. (CHEMICAL)/M.B.B.S./B.A.M.S./B.H.M.S./B.PHARMACY/B.Sc. (Hons. Sch.) COURSES,

SESSION 1998-99

The University will hold a Common Entrance Test for the following Courses on May 15 and 16, 1998.

1 **PUNJAB ENGINEERING COLLEGE, CHANDIGARH**
Bachelor of Engineering (Aeronautical, Civil, Computer Science and Engineering, Electrical, Electronics & Elect. Communication, Mechanical, Metallurgical and Production)

2 **CHANDIGARH COLLEGE OF ARCHITECTURE, CHANDIGARH**
Bachelor of Architecture

3. **DEPARTMENT OF CHEMICAL ENGINEERING & TECHNOLOGY**
Panjab University - B.E (Chemical)

4 **GOVERNMENT MEDICAL COLLEGE, CHANDIGARH - M.B.B.S.**
The test shall be open to all such candidates as

(a) attain the age of 17 years on or before December 31 of the year of admission,

(b) have passed both +1 (11th Class) and +2 (12th Class) examinations from Schools/Colleges recognised by the Chandigarh Administration and situated in the UT of Chandigarh, as regular students of the said Schools/Colleges with 50% marks in the aggregate of Physics, Chemistry, Biology and English at +2 level in first attempt. However, in the case of members of the Scheduled Castes, relaxation not exceeding 10% shall be allowed,

(c) are due to appear in +2 (12th Class) examination in March, 1998, but their admission to the test shall be provisional, which shall stand cancelled, if they fail to pass qualifying examination, securing the prescribed percentage of marks. Such candidates will not have any claim, whatsoever, with regard to their admission to the said course. Other eligibility conditions remain the same as in (b) above;

5. **SHRI DHANWANTRY AYURVEDIC COLLEGE, CHANDIAGARH - B.A.M.S.**

6 **HOMOEOPATHIC MEDICAL COLLEGE, CHANDIGARH - B.H.M.S.**

7. **UNIVERSITY INSTITUTE/TEACHING DEPARTMENTS**

Offering the following Courses.

I) **University Institute of Pharmaceutical Sciences** : B Pharmacy

II) **Teaching Departments :**
B.Sc (Hons. School) in Anthropology, Biochemistry, Bio-Physics, Botany, Chemistry, Geology, Mathematics, Microbiology, Physics and Zoology

FOR DETAILED INFORMATION REGARDING MINIMUM QUALIFICATIONS/ELIGIBILITY CONDITION(S)/DATE SHEET/ RULES/REGULATIONS/INSTRUCTIONS/PRESCRIBED FEE FOR THE COURSE(S) SUBJECTS(S)/ COMBINATION OF SUBJECTS/ SYLLABI/ SAMPLE QUESTIONS ETC. FOR THE ABOVE MENTIONED COURSES (1-7), THE CANDIDATES ARE ADVISED TO CONSULT THE PROSPECTUS FOR C.E.T. - 1998.

CENTRES FOR THE COMMON ENTRANCE TEST:
CHANDIGARH, DELHI & LUDHIANA

AVAILABILITY OF PROSPECTUS AND APPLICATION FORMS

The prospectus (including application form) will be made available for sale from Monday, Feb. 9, 1998 and can be had, on payment from any one of the following sources;

i) **The Cashier, Panjab University, Chandigarh** on payment of Rs. 120/- at the counter only;

ii) **The Librarian, Panjab University Extension Library, Civil Lines, Ludhiana** on payment of Rs. 120/- at the counter only;

iii) **The Manager, Publication Bureau, Panjab University, Chandigarh**
by Regd. Book-Post on remitting Rs 140/- only through Bank Draft drawn in favour of the **Registrar, Panjab University, Chandigarh** (Payable at Chandigarh) No request for supply of prospectus including application form by post shall be entertained, if it is received in the **University Office after Monday, March 2, 1998.**

The last date for receipt of application forms complete in all respects either by hand or by post in the office of **Assistant Registrar (CET Cell) is Monday, March 16, 1998** (upto 5.00 p.m.). Thereafter, the application forms will, however, be accepted if submitted **ONLY PERSONALLY** on working days upto **Tuesday, March 24, 1998 (up to 5.00 p.m.)** with additional (late) fee of Rs. 500/- per form.

Incomplete application forms and those received after 5.00 p.m. on 16.3.1998 (with normal fee) and those received after 5.00 p.m. on 24.3.1998 [which is the last date with additional (late) fee of Rs. 500/-] shall not be entertained under any circumstances, whatsoever, regardless of the fact whether the application form is sent by post or through courier or by any other means. No Roll No. to such applicants shall be issued and no correspondence, whatsoever, in this connection shall be made or entertained by the University. The Panjab University does not take any responsibility for any postal delay or delay in delivery by courier or by any other means or for loss in transit of the APPLICATION FORM.

Controller of Examinations

THESES OF THE MONTH

A list of doctoral theses accepted by Indian Universities

AGRICULTURAL & VETERINARY SCIENCES

Agronomy

1. Shukla, Sugriv. **Phosphorus and zinc management in rice-wheat-cropping system.** (Dr D S Yadav), Department of Agronomy, Narendra Deva University of Agriculture & Technology, Faizabad.

Genetics and Plant Breeding

1. Singh, Raj Bahadur. **Genetic studies for yield and its component traits in Indian mustard (Brassica juncal) zern & coss.** Department of Genetics and Plant Breeding, Narendra Deva University of Agriculture & Technology, Faizabad.

Horticulture

1. Mishra, Maneesh. **Micropropagational studies in Aonla (Emblioa officinalis gaertn).** (Dr R K Pathak), Department of Horticulture, Narendra Deva University of Agriculture & Technology, Faizabad.

2. Shaha, Suresh Ratanchand **Heterosis and combining ability studies in ridge gourd (Luffa acutangula roxb.L).** (Dr P N Kale), Department of Horticulture, Mahatma Phule Krishi Vidyapeeth, Rahuri

Plant Pathology

1 Bhanudas, Gade Vishwanath **Studies on biological control of important post harvest diseases of apple.** Department of Plant

Pathology, Dr Yashwant Singh Parmar University of Horticulture & Forestry, Nauni

BIOLOGICAL SCIENCES

Biochemistry

1. Anupam **Studies on development of membrane sensors and their analytical applications.** Department of Bioscience & Biotechnology, University of Roorkee, Roorkee.

2 Anwar, Adil **Studies on the digestive protease of spilosoma oblique.** (Prof M Saleemuddin), Department of Biochemistry, Aligarh Muslim University, Aligarh.

3. Goyal, Meenakshi **Comparative studies on metabolic effects of abnormal thyroid functioning in humans and rats.** Department of Biochemistry, Punjab Agricultural University, Ludhiana.

4. Gurdeep Kaur. **Effect of cotton leaf curl virus(CL Cu V) on the polyphenol metabolism in cotton(Gesaypium sp.).** Department of Biochemistry, Punjab Agricultural University, Ludhiana.

5. Kaur, Inderjeet. **Studies on the decay of some pesticides and identification of their metabolites.** Department of Bioscience & Biotechnology, University of Roorkee, Roorkee.

6. Kumar Umesh **Isolation and characterization of stress tolerant strains of rhizobium.** Department of Bioscience & Biotechnology, University of Roorkee, Roorkee.

7. Roy, Shalini. **Analytical and biochemical studies of fenitrothion.** Department of Bioscience & Biotechnology, University of Roorkee, Roorkee.

8. Sen, Soma. **Biochemical studies on vacuolar atpase of legumes: Tonoplast Atpase from peanut.** Department of Bioscience & Biotechnology, University of Roorkee, Roorkee.

9. Swain, Prabodh Kumar. **Molecular and biochemical studies on anthrax lethal toxin.** Department of Bioscience & Biotechnology, University of Roorkee, Roorkee.

Botany

1. Hayat, Shamsul. **Influence of some physical factors on the metabolic state and leakage in pea seed.** (Dr Aqil Ahmad), Department of Botany, Aligarh Muslim University, Aligarh.

2 Kalyani, Yarramsetty **Microbiological and eco-physiological studies of Bhadrakali lake, Warangal, AP.** (Dr M A Singara Charya), Department of Botany, Kakatiya University, Warangal.

3. Lingappa, Gadi. **Selection of fe-efficient lines in sugarcane through cell and tissue culture.** (Dr G R Naik), Department of Botany, Gulbarga University, Gulbarga.

4. Pranitha, V. **Microflora of industrial effluents with reference to two weed plants.** (Prof S M Reddy), Department of Botany, Kakatiya University, Warangal.

5. Savaleram, Kale Vijay. **Physiological studies in Datura metal L under saline conditions.** (Dr M G Shitole), Department of Botany, University of Pune, Pune.

6. Venu, Ch. **Genetical and tissue culture studies on grain legumes.** (Dr A Sadanandam), Department of Botany, Kakatiya University, Warangal.

7. Wani, Ab, Hamid. **Integrated control of plant parasitic nematodes.** (Prof M Mashkoor Alam), Department of Botany, Aligarh Muslim University, Aligarh.

Zoology

1. Kaur Tejinder. **Impact of Budha Nallah on the biology of some economically important fishes inhabiting river Satluj.** Department of Zoology, Punjab Agricultural University, Ludhiana.

2. Prabhu, Tharabai. **Biology of reproduction intermites with special reference to the termite odontotermes obesus (Rambur) (Isoptera: Termitidae).** (Dr S Basalingappa), Department of Zoology, Karnatak University, Dharwad.

3. Singh, Mayengbam Pishak. **Ecology of Loktak lake with special reference to fish and fisheries of the lake.** (Prof H Tombi Singh), Department of Life Science, Manipur University, Imphal.

EARTH SYSTEM SCIENCES

1. Gupta, Pankaj. **Landslide hazard zonation mapping considering geoenvironmental conditions, of parts of Bhagirathi River valley, UP, India.** Department of Earth Science, University of Roorkee, Roorkee.

2. Kapur, Nipun. **Analysis of earthquake related upper crustal stresses and ground displacements in the Himalaya.** Department of Earth Science, University of Roorkee, Roorkee.

3. Rastogi, Anupama. **A finite difference alogorithm for two-dimensional inversion of geoelectromagnetic data.** Department of Earth Science, University of Roorkee, Roorkee.

4. Sahoo, Jayaram. **Petrogenesis of the banded gneissic complex around Masuda, Rajasthan: Implications for the precambrian crustal evaluation of the Aravalli Craton, NW India.** Department of Earth Science, University of Roorkee, Roorkee.

5. Sarkar, Shantanu. **Landslide hazard zonation and slope stability assessment techniques: Applications to Srinagar-Rudra Prayag, Garhwal Himalaya.** Department of Earth Science, University of Roorkee, Roorkee.

6 Thomas V, Jayaprakash. **Evaluation of the indogangetic/ foreland basin during plio-pleistocene period as inferred from Haripur-Kolar section, H P India.** Department of Earth Science, University of Roorkee, Roorkee

Geology

1. Alam, Mohd Masroor. **Clastic petrofacies and diagenetic evolution of Jodhpur sandstone (Marwar supergroup), Western Rajasthan, India.** (Prof Khursheed Akhtar), Department of Geology, Aligarh Muslim University, Aligarh.

ENGINEERING SCIENCES

Civil Engineering

1. Azadani, Sayed Masoud Nasr. **Evaluation of mastic asphalt concrete as a wearing course.** Department of Civil Engineering, University of Roorkee, Roorkee.

2. Ghosh, Jayanta Kumar. **Mapping of tea gardens from satellite images: A fuzzy knowledge-based image interpretation system.** Department of Civil Engineering, University of Roorkee, Roorkee.

3. Goel, Tripta. **Critical appraisal and analysis of privatisation in urban bus transport system.** Department of Civil Engineering, University of Roorkee, Roorkee.

4. Gupta, Anand Swaroop. **Engineering behaviour and classification of weathered rocks.** (Dr K Seshagiri Rao), Department of Civil Engineering, Indian Institute of Technology, Delhi.

5. Gupta, M S. **Removal of cadmium and lead from effluents by adsorption in a moving media reactor.** Department of Civil Engineering, University of Roorkee, Roorkee.

6. Katibeh, Homayoon. **Effect of drainage size and subsoil stratification on canal seepage.** Department of Water Resource Development Training Centre, University of Roorkee, Roorkee.

7. Kumar, Naresh B G. **Aerodynamics of cable stayed bridges.** Department of Civil Engineering, University of Roorkee, Roorkee.

8. Praveen Kumar. **Facility based optimal rural road-network design.** Department of Civil Engineering, University of Roorkee, Roorkee.

9. Seehra, Sohan Singh. **Investigations on rollcrete pavement layers.** Department of Civil Engineering, University of Roorkee, Roorkee.

10. Singh, Ajay Kumar. **Mathematical modelling of transient flows in alluvial streams.** Department of Civil Engineering, University of Roorkee, Roorkee.

11. Singh, Indrasen. **Analysis and integration of mass rapid transit system in a metropolitan city.** Department of Civil Engineering, University of Roorkee, Roorkee.

Electrical Engineering

1. Bhanot, Vimal. **Secure operation of power system under critical loading conditions.** Department of Electrical Engineering, University of Roorkee, Roorkee.

Electronics & Computer Engineering

1. Akki, Channapa B. **Performance analysis of stage-rerouting switches for ATM networks.** Department of Electronics & Computer Engineering, University of Roorkee, Roorkee.

2. Mishra, Vishwambhar Nath. **Development and characterisation of tin oxide based gas sensors.** Department of Electronics & Computer Engineering, University of Roorkee, Roorkee.

3. Saxena, Rajiv. **Synthesis and characterization of new window families with their applications.** Department of Electrical & Computer Engineering, University of Roorkee, Roorkee.

4. Sharma, Gopal Krishan. **Test pattern generation for visi circuits.** Department of Electronics & Computer Engineering, University of Roorkee, Roorkee.

5. Sinha, Sunil Kumar **Some results in model-based adaptive and sliding observer aided controller structure robot manipulators.** Department of Electronics & Computer Engineering, University of Roorkee, Roorkee.

Energy Studies

1. Prabhulingaraj Avanti. **Computer aided analyses of high performance solar ponds and hot water systems.** (Dr N D Kaushika), Centre for Energy Studies, Indian Institute of Technology, Delhi.

Hydrology

1. Kurothe, R S. **Development of physically based flood frequency models.** Department of Hydrology, University of Roorkee, Roorkee.

2. Shakeel, Mohammad. **An integrated approach for evaluation of hydraulic properties of Alluvial aquifers.** Department of Hydrology, University of Roorkee, Roorkee

3 Sharma, Anupma **Numerical modelling of seawater transport in coastal aquifers.** Department of Hydrology, University of Roorkee, Roorkee.

Mechanical & Industrial Engineering

1. Barua, Parimal Bakul. **Investigation and optimization of V-process parameters affecting the quality of Al-7 Si alloy castings using Taguchi technique.** Department of Mechanical & Industrial Engineering, University of Roorkee, Roorkee.

2. Rawal, A H. **Heat transfer during precolling of fruits and vegetables in rectangular packages.** Department of Mechnical & Industrial Engineering, University of Roorkee, Roorkee.

3. Kader, Mushtaq M A. **A nonlinear optimization technique for the design of compact spur gear set.** Department of Mechanical and Industrial Engineering, University of Roorkee, Roorkee.

Materials Engineering

1. Jha, Bimal Kumar. **Stabilization and transformation characteristics of retained austenite in low carbon low alloy steels.** Department of Met & Materials Engineering, University of Roorkee, Roorkee.

TECHNOLOGY

Paper Technology

1. Kukreja, Vijay Kumar. **Modelling of washing of brown stock on rotary vacuum washer.** Institute of Paper Technology, University of Roorkee, Roorkee.

2. Singh, Raghuvir. **Corrosion investigation on materials of bleach washers.** Institute of Paper Technology, University of Roorkee, Roorkee.

Textile Technology

1. Bhattacharyya, Shantanu. **Modifications of acrylic fibres.** (Prof A K Mukherjee and Dr R Varadarajan), Department of Textile Technology, Indian Institute of Technology, Delhi.

MATHEMATICAL SCIENCES

Mathematics

1 Ahmad, Izhar. **Optimality conditions and duality in mathematical programming.** Department of Mathematics, University of Roorkee, Roorkee.

2. Anumesh Kumar. **On a matrix differential operator of third order.** Department of Mathematics, Veer Kunwar Singh University, Ara.

3. Anwar, Naushad. **A study of some problems on magnetohydrodynamics flow under uniform transverse magnetic field.** (Dr B K Mishra), Department of Mathematics, Vinoba Bhave University, Hazaribag

4. Sharma, Janak Raj. **Some spherically, planer and cylindrically symmetric fluid distributions in general theory of relativity.** Department of Maths, University of Roorkee, Roorkee.

5. Sharma, Mahesh Kumar. **Effects of differential rotation and tidal distortion on the structure and oscillations of stars.** Department of Mathematics, University of Roorkee, Roorkee.

6. Shukla, Ajay Kumar. **On some problems of analysis & theory.** (Dr Mumtaz Ahmad Khan), Department of Applied Mathematics, Aligarh Muslim University, Aligarh

7 Tyagi, Babita. **Mathematical modelling of bod-do related problems in a stream.** Department of Mathematics, University of Roorkee, Roorkee.

PHYSICAL SCIENCES

Chemistry

1 Joshi, Shalini. **Thin layer chromatographic studies on amino acids and some important pharmaceuticals.** Department of Chemistry, University of Roorkee, Roorkee.

2. Khurana, Upendra. **Electroanalytical studies on some heterogeneous membranes as ion sensors.** Department of Chemistry, University of Roorkee, Roorkee.

3. Mouly, Chandra, B. **A chemical examination of a few plants of medicinal importance from Andhra Pradesh.** (Prof P S Rao), Department of Chemistry, Kakatiya University, Warangal.

4. Pradhan, Bhabendra Kumar. **Studies on surface properties of activated granular carbon and activated charcoal cloth.** (Prof N K Sandle and Prof N K Jha), Department of Chemistry, Indian Institute of Technology, Delhi.

5. Sahoo, Binod Behari. **Kinetics and mechanism of aminolysis of some nitro activated O-dryl oxmes in organic solvents.** Department of Chemistry, University of Roorkee, Roorkee

6 Singh, Ratnesh Prasad. **Spectroscopic, magnetic and conductometric studies of complexes of divalent metal-ionswith some sulphur, selenium and nitrogen containing ligands.** (Dr B Singh), Department of Chemistry, Patna University, Patna.

7. Tyagi, Anil Kumar. **Studies on rapeseed high molecular weight protein.** Department of Chemistry, University of Roorkee, Roorkee.

8. Venkateshwar Rao, Tumula. **Synthetic application of certain metal chelates as catalysts in oxidation reactions.** Department of Chemistry, University of Roorkee, Roorkee.

9 Vineeta, **TLC studies of compounds of pharmaceutical and analytical importance using impregnated layers.** Department of Chemistry, University of Roorkee, Roorkee.

Physics

1. Senguttuvan, T D. **Sol gel derived SnO2 and Zro2 films: Synthesis and characterization.** (Prof L K Malhotra), Department of Physics, Indian Institute of Technology, Delhi.

2 Shiddalingaswamy, Kadadevarmath Jagadish **Electronic excition energy transfer and quenching studies in organic liquid scintillator systems.** (Dr G C Chikkur), Department of Physics, Karnatak University, Dharwad.

3. Verma, Vijay Kumar. **Charged particle initiated processes and angular correlation studies in atomic collisions.** Department of Physics, University of Roorkee, Roorkee

Government of India

MINISTRY OF HUMAN RESOURCE DEVELOPMENT

Department of Education

THE BRUNEI DARUSSALAM GOVERNMENT SCHOLARSHIPS FOR COMMONWEALTH COUNTRIES TENABLE IN BRUNEI DARUSSALAM FOR THE 1998-99 ACADEMIC YEAR

Applications on plain paper as per prescribed format are invited from Indian nationals residing in India for the above mentioned Commonwealth Scholarships for Master's Programme in Brunei Darusalam tenable from August 1998. *NUMBER OF NOMINATIONS TO BE SENT : THREE. SUBJECT FIELDS :* a) M.Sc (Petroleum Geoscience) by Coursework & Research. b) M. Islamic Studies by Research, c) Master of Education (In Language Education, Science and Mathematics Education and Educational Management).

ELIGIBILITY : Applicants must be citizens of India and must be between the ages of 18-25 as on **31.8.1998.**

MINIMUM QUALIFICATIONS REQUIRED : Applicants for the Master's programme must have completed Bachelor's Degree in the subject field of Petroleum Geoscience by securing 60% or above marks and 55% or above marks in the subject fields of Islamic Studies and Education.

TERMS OF AWARD : 1) The scholar will be exempted from payment of tuition and Students Union fees 2) Air-tickets by economy class for which the scholar will only be provided on the following occasions : 1) from the scholar's home country to Brunei Darussalam at the commencement of the programme; 2) from Burnei Darussalam to the scholar's home country after completion of the programme 3) Free board and lodging will be provided. 4) Medical and dental treatment will be made available at any Government hospital. 5) The scholar will receive a travelling allowance of B$ 58.00 a month if he/she opts not to live in the accommodation provided but no additional allowance will be given in lieu of Board and Lodging. 6) other allowances payable will include : 1) a personal allowance of B$ 500.00 per month; 2) an annual book allowance of up to B$ 600.00; 3) a once only grant of up to B$ 150.00 for ther purchase of spectacle if these are medically prescribed during tenure of the scholarship; 7) The shipment of personal effects of up to 20 cubic feet to home country after the completion of the course.

GENERAL INFORMATION : 1) The final selection of the nominated candidates rest with the Donor Government. 2) Each application must be accompanied by attested copies of : (a) certificate of age, (b) Mark Sheet of the qualifying examinations, (c) all degree/ diplomas/certificates. 3) Candidates who have already been abroad for study/training/specialisation either on scholarship or on their own for a period exceeding 6 months are eligible to apply only if they have been in India for at least two consecutive years, on their return from abroad, as on 31.3.1998. 4) Applications in subject fields other than those specified above will not be considered 5) Applications of candidates who are abroad will not be considered. 6) Candidates must furnish two copies of their plan of study/research proposal not exceeding 200 words justifying their studies in Brunei Darussalam 7) Candidates who do not possess the requisite qualifications need not apply. 8) Candidates shall have adequate Knowledge of geographical situation, cultural heritage of India and the donor country. 9) Documents submitted along with the application will not be returned. Hence, candidates are advised to send only the photocopies of the certificates etc. duly attested by competent authority (self attested certificates will not be accepted). 10) Since these scholarships are offered by Foreign governments, applications should invariably be submitted in English only. 11) Candidates must have good knowledge of written and spoken English (The donor country reserves the right to ask evidence of having passed an accredital English Language Test). 12) Employed candidates must send their application through their employers with a 'No Objection Certificate'. They will not a be called for interview unless the certificate is forwarded with the applications Application through proper channel should also reach this office by last date fixed for the purpose. 13) Mere fulfilment of requirement as laid down in the advertisement does not qualify a candidate for interview. Interview letters in a particular subject are sent only to the best candidates in order of merit after the applications are judged by a duly constituted Selection Committee of Experts. 14) Applications not in the prescribed proforma and applications received after the prescribed date and incomplete applications will not be considered. 15) Canvassing in any form will be a disqualification. 16) The Selection Committee's decision about candidates for interview or selecting a candidate for nomination will be final. No REPRESENTATION IN THIS REGARD WILL BE ENTERTAINED.

LAST DATE : Candidates should apply for the above scholarships on plain paper (preferably type written) furnishing the details of particulars in the given format to the UNDER SECRETARY (ES-4 SECTION), EXTERNAL SCHOLARSHIPS DIVISION, MINISTRY OF HUMAN RESOURCE DEVELOPMENT, DEPARTMENT OF EDUCATION, A-1/W-3, CURZON ROAD BARRACKS, KASTURBA GANDHI MARG, NEW DELHI-110 001 LATEST BY **26TH FEBRUARY 1998.** APPLICATIONS RECEIVED LATE WILL NOT BE ENTERTAINED

FORMAT OF APPLICATION

Recent Passport Size Photograph duly signed to be pasted

1. Name of the Scholarship Scheme :
2. Country for which applying :
3. Level of Course :
4. Subject (indicate one of the subject given in the advertisement)
5. (i) Name of the Candidate (in Block letters) & full mailing address with pin code and Telephone number, if any).
   (ii) Full name of Father/Mother/Guardian
6. (i) Sex : Male/Female
   (ii) Marital Status :
   (iii) Nationality .
7. Date of birth and the State to which the candidate belongs :
8. Whether a Member of SC/ST, if so, give full particulars (A certificate from competent authority should be attached).

9. Academic record starting from High School/Higher Secondary (Attested copies of certificates to be attached)

Name of the University Board/Institute	Examinations(s)	Date of passing	Division/Class with position, if any*	Percentage of Marks obtained and position if any (no rounding off)	Subject Taken

*In case no Division/Class is awarded and only grading is done, exact percentage of marks and Conversion formula adopted may be mentioned.

10. Details of professional/Practical Training and Research Experience, specifying the period and number of papers Published/Previous Employment
11. Nature of the present employment with name and date of appointment/designation and the name and address of the employer.
12. Have you been abroad? If so give full particulars of the country visited and the period of stay. Also mention the date, month and year of return to India (Purpose of visit also to be indicated).
13. Name and address of three persons who are familiar with your work (Two of them who taught you in an area of study relevant to course and the third may be your employer or a person with whom you have worked professionally).
14. Proposed programme of study/Research/Training Specifying details on a separate sheet.
    (i) The work at present engaged in
    (ii) Nature and programme of proposed study/research/training.
    (iii) Future plans/programme of proposed study/research/training.
    (iii) Future plans/proposals after the study/research/training and its prospectus

Enclosures : Pl. specify which is enclosed)

1 Proof of age.
2. Educational Qualifications.
3. Experience Certificates from the Employer. Attested Photocopies
4 University/College Transcript
5 No Objection Certificate from Employer.
6. Programme of study/Research.

15 **DECLARATION :** I certify that foregoing information is correct and complete to the best of my knowledge and nothing has been concealed/distorted I understand that if at any time I am found to have concealed/distorted any material information my selection shall be liable to summary termination without notice and compensation

Place
Date .

Signature of the Candidate

davp 97/711

Indira Gandhi National Open University
Electronic Media Production Centre
Training Workshops-1998

Name Of The Workshop	Date	Number Of Participants	Target Group	Course Fee	Last Date Of Submitting Nominations
Advanced Lighting Techniques for TV Studio	15-17 March	10	Camerapersons Photographers/ Engineering Professionals	Rs. 4000/-	28 February
Chroma Key	10-11 April	10	Camerapersons/ Engineering Professionals	Rs 3000/-	10 March
Presentation Techniques	17-18 April	12	Academics/ Production Professionals	Rs. 2000/-	15 March
Orientation Programme for Planners & Administrators In Distance Ed	8-9 May	12	Senior level Executives/ Planners/ Administrators (Educational Institutions)		10 April
Graphics for TV	22-23 May	10	Graphic Artist/Designer	Rs. 3000/-	20 April
Modular Set Designing	5-6 June	10	Set Designers	Rs. 3000/-	5 May
Interview Techniques	12-13 June	12	Academics/ Media Professionals	Rs. 2000/-	10 May

For further details contact : Director, EMPC, IGNOU, Maidangarhi, New Delhi-110 068

Telephones : 6868407/6857063/6857064/6857065 Fax : 6857079/6989076

INDIAN COUNCIL OF AGRICULTURAL RESEARCH

Krishi Anusandhan Bhavan, Pusa : New Delhi-110 012

EDUCATION DIVISION

ADMISSION TO STATE AGRICULTURAL UNIVERSITIES/DEEMED UNIVERSITIES AND NATIONAL TALENT SCHOLARSHIP IN AGRICULTURE

IIIrd ALL INDIA ENTRANCE EXAMINATION FOR ADMISSION TO UNDER-GRADUATE COURSES IN AGRICULTURE AND ALLIED SCIENCE INCLUDING VETERINARY SCIENCE FOR THE ACADEMIC SESSION 1998-99 AND AWARD OF **NATIONAL TALENT SCHOLARSHIP.**

Indian Council of Agricultural Research, New Delhi will conduct an All India Entrance Examination for filling up 15% of the total number of seats in State Agricultural Universities, Central Agricultural University, Imphal, Manipur & 100% of the Seats in National Dairy Research Institute, Karnal (Haryana) in different subjects viz. Agriculture, Horticulture, Fisheries Science, Forestry, Home Science, Sericulture, Veterinary Science, Agricultural Engineering, Dairy Technology, Food Science & Technology and Agriculture Marketing, Banking & Co-operation.

Date & Venue of the Examination : Sunday the **24th May, 1998** from 10.00 A.M. to 12.30 P.M. at different examination Centres as stated in the Information Bulletin.

National Talent Scholarship : N.T.S. @ Rs. 400/- per month shall be awarded on merit in each discipline provided the candidate opts to pursue studies in any State Agricultural Universities located outside the State of his/her domicile.

Number of scholarship (programme-wise) available as follows .

Programme	Number of Scholarship
1. B.Sc. (Agri) (Hons)	145
2. B.V Sc & A.H.	63
3. B.Sc (Horticulture)	15
4. B.Sc (Home Science)	20
5. B.Sc. (Forestry)	10
6. B Sc (Dairy Tech)	10
7. B.E., (Agril. Engineering)	20
8. B Sc (Fisheries Science)	10
9. B.Sc. (Food Science & Tech)	2
10. B.Sc. (Agri. Marketing, Banking & Co-op)	3
11. B.Sc. (Sericulture)	2

N.B. The number of scholarship in the programme of study can be changed subject to the strength of candidates opting for a particular programme.

Scheme of Examination : There will be one question paper consisting of Physics, Chemistry & Biology/Mathematics/ Agriculture carrying 180 questions. Candidate will have to attempt (1) Physics, (2) Chemistry & (3) Biology (Botany & Zoology) or Mathematics or Agriculture paper as per their eligibility and choice of the subject. Each subject will have 60 questions.

Eligibility : The candidate must be atleast 17 years of age on or before 31.12.1998. No relaxation to age will be given to any categories of candidate. He must have passed and obtained not less than 60% marks of the total marks in 10+2 examination or qualified examination in the papers other than English. In respect of candidates belonging to SC/ST categories, the minimum marks required for qualifying examination shall be 55%. The candidate should have passed in English in qualifying examination. Those who have appeared or are due to appear in plus two or equivalent examination in 1998 can also appear in this test subject to their fulfilling the eligibility criteria mentioned below on the date of counselling. **He/She will be declared disqualified if proof of having cleared 10+2 examination is not produced at the time of counselling.**

Sl. No	Subject	Code No	Subjects, which the candidate must have taken 10+2/qualifying examination	Subject to be attempted in examination
1.	Agriculture	01	PCB/PCBM/PCA*/PCM*	PCB/PCM/PCA
2	Horticulture	02	**PCB	PCB
3	Fisheries Science	03	PCB	PCB
4.	Forestry	04	PCBM	PCB/M
5	Home Science	05	PCB/PCM/PCH*/PCA*	PCB/M
6.	Sericulture	06	PCBM	PCB
7	Veterinary Science	07	PCB	PCB
8.	Agricultural Engineering	08	PCM	PCM
9	Dairy Technology	09	PCM	PCM
10	Food Science & Tech	10	PCM	PCM
11	Agril. Marketing Banking & Co-operation	11	PCBM	PCM

NOTE : P = Physics, C = Chemistry, B = Biology, M = Mathematics, A = Agriculture, H = Home Science

* = For Admission in limited Universities ** = +One additional subject in 10+2 in SAU of the State of Karnataka & Maharashtra

Information Bulletin & Application Form: Information Bulletin containing the Application Form and other details will be available **from 2nd February, 1998** and can be had against cash payment of Rs. 200/- for general category and Rs. 100/- for SC/ST category from Registrars Office of State Agricultural Universities and on payment of Rs. 200/- + Rs 5/- (Bank Charges) for General Category and **Rs. 100/- + Rs. 5/-** (Bank Charges) for Scheduled Caste/Scheduled Tribe category from Syndicate Bank branches specified in this advertisement The bank and Agricultural Universities will not be responsible if the forms are not available at any indicated place **The banks and Agricultural Universities will not send the information Bulletin by post,** hence no request should be made to them for sending the information Bulletin by post. The last date for sale of application forms by cash will be **16th march, 1998.**

Specified branches of Syndicate Bank :1. Gandhi Nagar, Port Blair, South Andaman, (Andaman & Nicobar Island), 2 Pavan Commercial Complex, Main Road, Daba Garden, Visakhapatnam (AP), 3 135 Motilal Nehru Road, Pan Bazar, Guwahati, Kamrup Distt., Asssam, 4. Sheohar Sadan, Frazer Road Corner, Patna (Bihar), 5. Pusa Complex, Krishi Anusandhan Bhawan Extension Counter, IARI, New Delhi, 6 Super Bazar Building, Connaught Circus, New Delhi. 7. Hotel Nova Goa Building, Dr Atmaram Borkar Road, Panaji, Goa, 8. SCO 66-67 Sector-17-B, Bank Square, Chandigarh, 9. Kalwa Chowk, M.G. Road, Junagarh, Gujarat-1, 10. Sanjay Gandhi Marg, Cantonment, Ambala, Haryana, 11. Mall Road No. 6, Shimla (HP), 12. No. 1, Exchange Road, Srinagar (J&K), 13. 3, Basaveshwara Road, Bijapur (Karnataka), 14. Kerala St. Co-op Agr & Rur Dev Bank Building, Statue Junction,

Thiruvananthapuram (Kerala), 15. Kavaratti, Kochi, Lakshdweep, 16. 29-30 Shiv Vilas Palace, Rajwada Chowk, Indore (MP), 17. 43/4 Vishwa Apartment, New Ashoka Stambh, Old Agra Road, Nasik (MS), 18. G.S. Road, Shillong (Meghalaya), 19. Nuzul Mahal, Brooks Hill, Sambalpur (Orissa), 20. Leela Bhawan Market Complex, Bhupendra Road, Patiala (Punjab), 21. 68 Old Dhanmandi, Ajay Market, Sarivar Cinema Road, Kota, 22. 197. Palace Road, Madurai (TN), 23. 45, Rajpur Road, Dehradun (UP), 24. 1, Parkar Road (GT Road Junction), Burdwan (WB).

Office of the Registrar, State Agricultural Universities : 1. ANGRAU, Hyderabad (AP), 2. AAU, Jorhat (Assam), 3. RAU, Pusa Samastipur (Bihar), 4. BAU, Ranchi (Bihar), 5 HAU, Hisar (Haryana), 6. HPKVV, Palampur (HP), 7. Dr. YS Parmar Hort. & Forestry University, Solan (HP), 8. UAS Bangalore (Karnataka), 9 UAS, Dharwar (Karnataka), 10. GAU, Sardar Krishinagar, Banaskantha (Gujarat), 11. JNKVV, Jabalpur (MP), 12. IGKVV, Raipur (MP), 13. KAU, Vellanikkara, Thrissur (Kerala), 14. KKV, Dapoli (MS), 15. MPKV, Rahuri (MS), 16. MAU, Parbhani (MS), 17. PDKV Krishnagar, Akola (MS), 18. OUA&T, Bhubaneshwar (Orissa), 19. PAU, Ludhiana (Punjab), 20 RAU, Bikaner (Raj.), 21. TNAU, Coimbatore (TN), 22. TNV&ASU, Chennai, 23. CSAUA&T, Kanpur (UP), 24, GBPUA&T, Pantnagar (UP), 25. NDUA&T, Faizabad (UP), 26 BCKVV, Mohanpur (WB), 27. WBUA&F, Belgachhia, Calcutta (WB), 28. SKUAS&T, Railway Road, Jammu (J&K).

However, Information Bulletin may also be obtained by post upto **2nd March, 1998** by sending a request alongwith Bank Draft of **Rs. 220/-** for General Category and **Rs. 120/-** for SC/ST category in favour of **Deputy Director General (Edn.) I.C.A.R., New Delhi** payable at New Delhi alongwith a self address envelope (size 12"x10") without postage stamps from the specified places of which addresses are given below. However, the request for supply of Information Bulletin by post received after **2nd March, 1998** will not be entertained.

The Information Bulletin may be obtained from the following addresses by post :

1. Director, National Academy of Agricultural Research & Management, Rajendranagar, Hyderabad-500 030. 2. Senior Scientist (Exam. Cell), Room No. 405, Indian Council of Agricultural Research, Krishi Anusandhan Bhavan, Pusa, New Delhi-110 012. 3. Campus Dean, Central Agricultural University (CAU), Imphal Manipur-795 001.

The last date for the receipt of application form to Senior Scientist (Exam. Cell) I.C.A.R., Krishi Anusandhan Bhavan, Pusa, New Delhi-110 012 is **20th March, 1998.** However for the candidate belonging to the remote areas viz. Mizoram, Assam, Meghalaya, Arunachal Pradesh, Manipur, Nagaland, Tripura, Sikkim, Ladakh Division of J&K State, Lahaul & Spiti District and Pangi Sub-division of Chamba District of Himachal Pradesh, Andaman & Nicobar Island and Lakshwadeep last date will be **3rd April, 1998.** Forms received after the last date and without Bank draft of full amount will be rejected and Education Division shall not be responsible for any postal delay.

All disputes relating to the conduct of this examination or any matter connected with this advertisement shall be in the jurisdiction of Delhi Courts only.

DEPUTY DIRECTOR GENERAL (EDN)

davp 1015(2)97

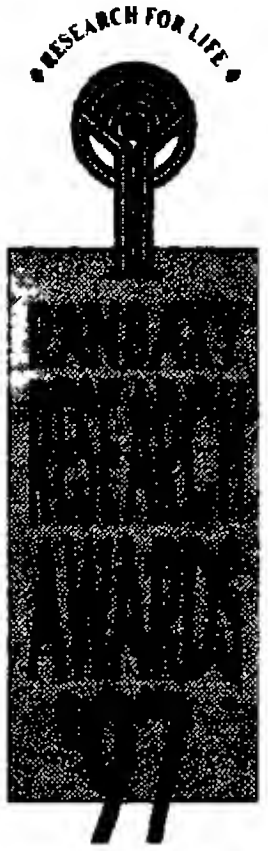
NORTH EASTERN REGIONAL INSTITUTE OF SCIENCE AND TECHNOLOGY
(Under Ministry of Human Resource Development Govt. of India)
ITANAGAR

Admission Notice

Applications in the prescribed form are invited for admission into M.Tech. courses for the session 98-99 (starting from Aug '98) for the AICTE approved courses of (1) Environment Science & Engg. and (2) Information Technology. The admission shall be made under different categories of (i) Full time student with institute scholarship under valid GATE/NET score and (ii) Sponsored Graduate Engineers. The candidates must have a minimum of 60% marks or equivalent in qualifying degree.

Application forms and other details are available from Deputy Registrar (Acad), NERIST, Nirjuli-791109, Itanagar, Arunachal Pradesh by sending a self addressed and stamped (Rs. 4.00) envelope of size 12 cm x 28 cm accompanied by a crossed bank draft of Rs. 100/- drawn in favour of Director, NERIST and payable at SBI, Nirjuli (9535 code). Last date for receipt of request for application form is 30.3.98 and Last date for receipt of completed applications is **15.4.98.** The shortlisted candidates may be called for an interview at their cost.

Deputy Registrar (Academic)



Nominations are invited from Heads of Research Institutions, Universities, Medical and Pharmaceutical Colleges, for Ranbaxy Research Awards - 1997 (4 awards of Rs. 100,000 - each) for excellence in original research in Medical and Pharmaceutical Sciences.

MEDICAL SCIENCES

One award each for Basic Research, Applied Research and Clinical Research

PHARMACEUTICAL SCIENCES

One award

Sponsored work of Indian Scientists, both in India and abroad, together with their bio-data, research achievements, awards received in the past and papers published, may be forwarded to the

Ranbaxy Science Foundation

by April 15, 1998

Detailed procedure is being circulated to Nominators and is also available from the office of the Foundation.

Research dissertations will be reviewed by a panel of judges comprising eminent scientists.

Non-Resident Indian Scientists are also eligible for these awards.

RANBAXY SCIENCE FOUNDATION

20, Sector 18, Udyog Vihar Industrial Area,

GURGAON - 122 001 (HARYANA) INDIA,

PHONE : 342027 FAX : (91-124) 342018

भारतीय जन संचार संस्थान, नई दिल्ली

1. पत्रकारिता में स्नातकोत्तर डिप्लोमा पाठ्यक्रम (अंग्रेज़ी), नई दिल्ली तथा ढेंकनाल, उड़ीसा
2. पत्रकारिता में स्नातकोत्तर डिप्लोमा पाठ्यक्रम (हिन्दी), नई दिल्ली
3. विज्ञापन और जनसम्पर्क में स्नातकोत्तर डिप्लोमा पाठ्यक्रम, नई दिल्ली
4. रेडियो और टेलीविजन पत्रकारिता में स्नातकोत्तर डिप्लोमा पाठ्यक्रम, नई दिल्ली

संस्थान : भारत सरकार के सूचना व प्रसारण मंत्रालय के अन्तर्गत काम कर रहा यह स्वायत्तशासी निकाय जनसंचार में उन्नत शिक्षा, प्रशिक्षण और शोध का राष्ट्रीय केन्द्र है । यह भारतीय सूचना सेवा के परिवीक्षार्थीनों के लिए परिचय पाठ्यक्रम, आकाशवाणी और दूरदर्शन के कर्मचारियों के लिए प्रसारण पत्रकारिता पाठ्यक्रम, गुटनिरपेक्ष देशों के लिए संवाद समिति पत्रकारिता डिप्लोमा पाठ्यक्रम तथा ऊपर दिए गए डिप्लोमा पाठ्यक्रमों के अलावा, कई अल्पकालीन पाठ्यक्रम, विशेष पाठ्यक्रम, कार्यशालाएं और प्रायोजित पाठ्यक्रम आयोजित करता है ।

अवधि : अगस्त 1998 से अप्रैल 1999 ।

योग्यता :

अनिवार्य : किसी भी विषय में स्नातक की उपाधि । जिन्होंने स्नातक की परीक्षा दी है/या देने जा रहे हैं, वे भी आवेदन दे सकते हैं ।

वांछनीय : (1) किसी भी विषय में स्नातकोत्तर उपाधि तथा (2) माध्यम से सम्बन्धित काम का अनुभव ।

जन्मतिथि : 1.8.1973 या बाद की (अनुसूचित जाति/जनजाति के लिए 1.8.1968 या बाद की और अन्य पिछड़े वर्गों के लिए 1.8.1970 या बाद की)।

कुल स्थान : पाठ्यक्रम 1 से 3 प्रत्येक में 40 तथा पाठ्यक्रम 4 में 25 । इसके अलावा अप्रवासी भारतीयों तथा विदेशी नागरिकों के लिए सीमित संख्या में सीटें उपलब्ध है ।

अनुसूचित जाति/अनुसूचित जनजाति/अन्य पिछड़े वर्गों के लिए सीटों का आरक्षण : केन्द्रीय सरकार के नियमानुसार।

शिक्षण एवं परीक्षा का माध्यम : पाठ्यक्रम (1) के लिए अंग्रेज़ी; पाठ्यक्रम (2) के लिए हिन्दी; पाठ्यक्रम 3 और 4 के लिए अंग्रेज़ी या हिन्दी।

छात्रावास : दिल्ली में उपलब्ध नहीं परन्तु ढेंकनाल में सीमित संख्या में उपलब्ध है ।

शुल्क : पाठ्यक्रम 1 और 2 प्रत्येक के लिए 10,000 रुपए, पाठ्यक्रम 3 के लिए 15,000 रुपए और पाठ्यक्रम 4 के लिए 25,000 रुपए।

निशुल्कता : योग्यता एवं उपलब्ध साधनों के आधार पर केवल चार आर्थी निःशुल्कता का प्रावधान है जो कि केवल पत्रकारिता पाठ्यक्रम (अंग्रेजी और हिन्दी) के लिये है ।

प्रवेश परीक्षा : 16 तथा 17 मई 1998 को नई दिल्ली, ढेंकनाल, कोट्टायाम में तथा विवरणिका में दिए गए अन्य केन्द्रों में । प्रवेश परीक्षा का ब्यौरा विवरणिका में दिया गया है ।

साक्षात्कार : 11 और 12 जुलाई 1998 को नई दिल्ली तथा पाठ्यक्रम (1) के लिए ढेंकनाल में भी ।

आवेदन–पत्र : आवेदन–पत्र (तथा विवरणिका), 200 रुपये प्रत्येक पाठ्यक्रम के लिए नकद देकर भारतीय जन संचार संस्थान, नई दिल्ली एवं 2) भारतीय जन संचार संस्थान, ढेंकनाल में कार्य दिवस के दौरान लिए जा सकते हैं। दिल्ली से बाहर के आवेदक उपरोक्त राशि के डिमांड ड्राफ्ट के साथ 27×17 से.मी. का लिफाफा, जिस पर 3 रुपये का डाक टिकट लगा हो और आवेदक का पता लिखा हो, सहायक कुलसचिव को भेजकर डाक द्वारा मंगवा सकते हैं । अनुसूचित जाति/जनजाति/अन्य पिछड़े वर्गों के आवेदक 100 रुपये के नकद भुगतान के साथ जाति प्रमाण–पत्र की सत्यापित प्रतिलिपि देकर प्रत्येक पाठ्यक्रम के लिए सहायक कुलसचिव से आवेदन–पत्र प्राप्त कर सकते हैं । दिल्ली से बाहर के अनुसूचित जाति/जनजाति/अन्य पिछड़े वर्गों के आवेदक 100 रुपये के डिमांड ड्राफ्ट के साथ टिकट लगा और अपना पता लिखा लिफाफा तथा जाति प्रमाण–पत्र की सत्यापित प्रतिलिपि सहायक कुलसचिव को भेजकर डाक द्वारा आवेदन–पत्र प्राप्त कर सकते हैं । आवेदन–पत्र के लिए प्रार्थना पत्र डिमांड ड्राफ्ट सहित संस्थान में 3 अप्रैल 1998 तक पहुंचने चाहिए। डिमान्ड ड्राफ्ट 'भारतीय जन संचार संस्थान, नई दिल्ली' के नाम का होना चाहिए। मनीआर्डर, पोस्टल आर्डर या चैक नहीं लिए जाएंगे ।

आवेदन–पत्र 3.4.98 तक उपलब्ध होंगे तथा विधिवत पूरे भरे हुए आवेदन–पत्र सहायक कुलसचिव, भारतीय जनसंचार संस्थान, अरुणा आसफ अली मार्ग, जे. एन. वि. वि. नया परिसर, नई दिल्ली 110067 के पास 10 अप्रैल 1998 तक या उससे पूर्व केवल पंजीकृत डाक द्वारा पहुँच जाने चाहिए । यद्यपि संस्थान पत्र व्यवहार में पूरा पूरा ध्यान रखता है और सावधानी बरतता है, लेकिन यह डाक की गलतियों या देरी के लिए उत्तरदायी नहीं होगा । विवादों (यदि कोई हो तो) का निपटारा केवल दिल्ली में ही होगा।

दूरभाष : 6171352, 6107462, 6160940, 6170920

जनसंख्या विज्ञान का अन्तर्राष्ट्रीय संस्थान

(विश्वविद्यालय समतुल्य)

international institute for population sciences

(DEEMED UNIVERSITY)

GOVANDI STATION ROAD
DEONAR, MUMBAI-400 088
INDIA

ADMISSION NOTICE

Applications are invited for admission to the following full-time courses of the Institute with Government of India fellowships for the academic session 1998-99 to commence from July 1998.

(1) **Master of Population Studies (M.P.S.) :** 25 Seats
(one year full time course)

Eligibility :

Master's degree in any of the following disciplines :

Statistics, Mathematics, Economics, Psychology, Sociology, Social Work, Geography and Anthropology.

Candidates appearing in the final year for qualifying examination by May/June 1998 may also apply but their admission is subject to marks obtained in the final year examination.

Fellowship :

Each selected candidate will be given a Government of India fellowship @ Rs. 1300/- per month.

Some officials can also be sponsored by Government departments, research institutions, universities, medical colleges and non-governmental organizations for being considered for admission.

(2) **Doctor of Philosophy (Ph.D) in Population Studies :** 2 Seats
(3 year full-time course)

Eligibility :

(i) Candidates having Master's degree in Population Studies of any university in India with atleast 55% of marks; and/or

(ii) Candidates who have passed National Eligibility Test (NET) in Population Studies.

Fellowship :

Each selected candidate will be awarded a Government of India fellowship @ Rs. 2500/- (Rupees two thousand five hundred only) per month along with a contingency grant of Rs. 5,000/- (Rupees five thousand only) per annum.

Selection Criteria :

Admission is purely based on merit and academic performance of the candidate only.

Reservation for SC/ST candidates will be considered as per the UGC norms.

Availability of Application form :

Prescribed application form and information can be obtained from the Assistant Registrar (Academic), International Institute for Population Sciences, Deonar, Mumbai-400 088 by sending a self addressed Rs. 10/- stamped envelope (25 cm x 12 cm) from March 10, 1998 to April 30, 1998.

Last date for submission of duly filled-in application form along with a Demand Draft for Rs. 50/- (Rupees fifty only) drawn from Nationalised Bank in favour of the Director, IIPS, Mumbai is : **May 22, 1998.**

February 4, 1998
Mumbai-400 088

DIRECTOR

INDIRA GANDHI INSTITUTE OF DEVELOPMENT RESEARCH, MUMBAI

(Deemed University)

An Advanced Research Institute

Established by the Reserve Bank of India

ADMISSION NOTICE

M.Phil/Ph.D. PROGRAMME IN DEVELOPMENT STUDIES : 1998-99

Indira Gandhi Institute of Development Research (IGIDR) invites applications for admission to its M.Phil./Ph.D. Programme in Development Studies covering economics, energy and environmental policy issues. The M.Phil. Programme is of two years duration and the Ph.D. programme can be completed in four years. The degrees are awarded on the basis of successful completion of a course work, and writing dissertations. Only those candidates who pass a set of Comprehensive Examinations in the coursework stage will be eligible for Ph.D. registration. The session will commence in August 1998.

Eligibility : (i) M.A. in Economics with **at least 55%** marks, (ii) MBA/MMS with a Bachelor's Degree in Economics, Engineering, or Physical Sciences, (iii) M.Sc. in Physical Sciences, Environmental Science, Mathematics, Operations Research, or Statistics, (iv) M.Tech., B.Tech., B.E. or equivalent In case of (ii), (iii) and (iv) the required minimum **marks are 60%.** Candidates who expect to complete their present study by 15th July 1998 may also apply.

Stipend : The students admitted into the Programme will receive a monthly stipend that is revised from time to time. The stipend is currently Rs. 4000/- in the first two years, and after Ph.D. registration Rs. 5000/- in the third and fourth years. Students are also required to provide Research Assistance. Tuition fees are Rs. 1500/- per semester. Limited multiseated hostel accommodation is available on the campus.

Admission Test : Candidates will be selected on the basis of their academic records and performances in the written test and interviews conducted by the Institute in June/July 1998. Short-listed candidates will be first tested on quantitative and verbal skills, and the candidates found suitable from the test will be interviewed. The decision of the Selection Committee will be final. Second class return rail fare by the shortest route will be paid to appear for the selection.

Application Forms : Prospectus and application forms can be obtained in person from or writing to the Admissions Office, IGIDR, Gen A.K. Vaidya Marg, Goregaon (East), Mumbai 400 065, on payment or Rs. 100 (non-refundable) in cash or demand draft drawn in favour of Indira Gandhi Institute of Development Research payable at Mumbai. Payment in any other form will not be accepted. Completed applications must reach IGIDR by **March 31, 1998.**

Admission Notice 1998-99

INDIAN INSTITUTE OF MASS COMMUNICATION, New Delhi

1. Post-graduate Diploma Course in Journalism (English), New Delhi & Dhenkanal (Orissa)
2. Post-graduate Diploma Course in Journalism (Hindi), New Delhi
3. Post-graduate Diploma Course in Advertising and Public Relations, New Delhi
4. Post-graduate Diploma Course in Radio & Television Journalism, New Delhi

THE INSTITUTE : IIMC, a national centre for advanced teaching, training and research in Mass Communication, is an autonomous body under the Ministry of Information and Broadcasting. It conducts Orientation Course for Probationers of Indian Information Service, Broadcast Journalism Course for personnel of All India Radio and Doordarshan, Diploma Course in News Agency Journalism for Non-aligned Countries and a number of short courses, specialised courses, workshops and sponsored courses, besides the above-mentioned Post-graduate Diploma Courses.

DURATION : August 1998 to April 1999

ELIGIBILITY :

Essential : Bachelor's degree in any discipline. Those who have appeared/are appearing at the degree examination are also eligible to apply.

Desirable : 1) Post-graduate degree in any discipline and 2) Media-related work experience.

DATE OF BIRTH : 1.8.1973 or later (in case of SCs/STs . **1.8.1968 or later** and for OBCs **1.8.1970 or later.)**

NO. OF SEATS : 40 each in Course No. 1 to 3 and 25 in Course No. 4. In addition a limited number of seats are available for NRIs and Foreign Nationals.

RESERVATION OF SEATS FOR SCs/ STs/OBCs : As per Government Rules.

MEDIUM OF INSTRUCTIONS AND EXAMINATION : English for course 1; Hindi for course 2; English or Hindi for course 3 & 4.

HOSTEL: Not available at New Delhi and limited seats available at Dhenkanal.

FEE : Course Nos.1 & 2 Rs. 10,000 each, Course No. 3 Rs. 15,000 and Course No. 4. Rs. 25,000.

FREESHIPS : Four half freeships are available on merit -cum-means basis, only in Journalism(English & Hindi) courses.

ENTRANCE EXAMINATION : On 16 & 17 May 1998 in New Delhi, Dhenkanal, Kottayam and other centres mentioned in the prospectus. Details are included in the prospectus.

INTERVIEW : On **11&12 July 1998** in New Delhi & for course No 1 at Dhenkanal also.

APPLICATIONS : Application forms (and prospectus) can be obtained on payment of Rs. 200/- in cash for each course from : The Indian Institute of Mass Communication, New Delhi & 2) The Indian Institute of Mass Communication, Dhenkanal, **during office hours.** Outstation applicants can obtain the forms from the Assistant Registrar by post by sending a demand draft for the amount along with a self-addressed and stamped (Rs. 3.00) envelope (27 × 17 cm). SCs/STs/OBCs applicants can obtain the forms from the Assistant Registrar on payment of Rs. 100 **for each course** in cash along with an **attested copy** of the Caste Certificate. **Outstation** SCs/STs/OBCs applicants can obtain the forms by sending a DD for Rs. 100 with a **self-addressed** and stamped envelope and an **attested copy** of Caste Certificate. Request for Application Forms should reach the Institute latest by 3 April 1998. The DD should be drawn in favour of **"INDIAN INSTITUTE OF MASS COMMUNICATION, NEW DELHI". No. MO, Postal Order or Cheque will be accepted.**

LAST DATE for issue of application forms is **3.4.98** and completed application forms **must** reach the Assistant Registrar, IIMC, Aruna Asaf Ali Marg, JNU New Campus, New Delhi 110067 only by Regd. Post on or before 10 April 1998.

While the Institute takes every care and caution in sending communication, it does not take any responsibility for postal lapses or delay.

The dispute, if any, will be Judiciable in Delhi only.

Tel. Nos. 6171352, 6107462, 6160940, 6170920

CLASSIFIED ADVERTISEMENTS

INTERNATIONAL INSTITUTE FOR POPULATION SCIENCES

(Deemed University)

Applications are invited for the following ad-hoc posts for **District Level Survey on Reproductive and Child Health Project funded by World Bank.** All appointments will be purely on contract basis as per the need of the Project

(I) **Research Officer** : 8 Posts

a. **Qualifications required** : Ph.D in Demography or Social Sciences including Statistics/ Mathematics with Experience in handling large Demographic Surveys OR Master in Population Studies with 3 years experience in handling large Demographic Surveys

b. **Pay** : Rs 7500/- per month consolidated.

c **Age** : Not more than 35 years.

(II) **SENIOR ACCOUNTANT** : 1 Post

a. **Qualifications required** : B Com degree with 5 years experience in Accounts Department of Govt /Autonomous Institution. Preference will be given to those having Diploma/Certificate in Computer application and experience of working in an Educational/Research Institution. Retired persons may also apply

b **Pay** : Rs. 7500/- per month consolidated

Applications on plain paper alongwith attested copies of degrees and testimonials, birth certificate, marksheets, published research articles, certificate of experience, etc. should reach the following address on or before **March 02, 1998.**

Director
International Institute for Population Sciences
Govandi Station Road, Deonar, MUMBAI # 400 088.

K.B. Pathak
DIRECTOR

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Nuclear Science Centre is an autonomous organisation established by the UGC for accelerator based research in various disciplines. A 15 Million Volt Tandem is available in-house with research programs in nuclear physics, materials science and various inter-disciplinary areas. A superconducting linear accelerator is currently under construction with resonator development jointly with Argonne. It has a 600 Watt helium refrigerator and a large closed loop nitrogen reliquefier. The Centre has plans to have a parallel activity to develop high current injector based on ECR ion source and low beta resonators and also Accelerator Mass Spectrometry with the existing tandem. A large internal computer network with Internet facility is available. A materials science program in some focused areas is also planned.

Applications are invited form Indian citizens for the following positions

1. **SCIENTIST (SF)** (Rs. 4500-5700)

Senior experimental physicist in materials science Must be capable of leading his/her own research program using heavy ion beams Ph.D. with 9 years experience Highly qualified candidates may be considered for higher grades

2 **SCIENTIST (SE)** (Rs 3700-5000) 3 Posts

Physicist/Technologist with experience in cryogenics, or ion sources, beam transport systems or accelerator based mass spectrometry and/or other accelerator associated developments Ph.D with 4 years experience or M Tech with 6 years experience desirable. Highly qualified candidates may be considered for higher grades

3. **SCIENTIST (SD)** (Rs 3000-4500)

Scientist/Technologist with experience in information technology B E with 5 years experience/M Tech with 2 years experience

Minimum total monthly emoluments in the grades SD, SE and SF are, at present Rs 9,370, Rs 11,005 and Rs. 12,165 respectively (likely to be revised as per fifth pay commission) The posts carry other allowances like HRA and benefits like GPF cum Gratuity cum Pension, LTC and medical reimbursements Leased accommodation may be provided in lieu of HRA.

The interested persons may apply to the Director, Nuclear Science Centre, Post Box No 10502, Aruna Asaf Ali Marg, New Delhi-110 067, India (Fax 011-6893666) with full curriculum vitae along with the names of three referees by **March 31, 1998.**

davp 1304/7/97

INDIAN COUNCIL OF MEDICAL RESEARCH

(Advt. No. 1/98-Hqrs. Office)

Applications are invited up to **28.2.1998** for one post of **Documentation Officer** in the scale of pay of Rs 8000-275-13500 in the Hqrs. Office of the Council at New Delhi

Essential Qualification and Experience

(i) Master's Degree in science,
(ii) A degree in Library Science from a recognised University; and
(iii) Experience as Librarian or as Documentation Assistant in a Scientific Organization for at least 10 years

Desirable

(i) Experience in handling biomedical information through printed and computerised data bases
(ii) Experience in handling computers and software relating to library operations and CD-ROM based information retrieval systems
(iii) Additional qualification/training information science.

Age Limit

40 years as on 28.2.98 (SC/ST/OBC candidates are allowed ager in accordance with Govt. of India Rules in force)

Benefits of Pension is admissible

Application forms and details are obtainable from the Indian Council of Medical Research (Administration Section-I), Ansari Nagar, New Delhi-110 029 [Forms duly completed should also be addressed to DG at the same address alongwith a crossed IPO for Rs. 8/- payable to DG, ICMR at New Delhi.]

ANY CANVASSING BY OR ON BEHALF OF THE CANDIDATES OR BRINGING POLITICAL OR OTHER OUTSIDE INFLUENCE WITH REGARD TO SLECTION/ RECRUITMENT SHALL BE DEEMED AS DISQUALIFICATION

—davp 1301(4)97

"Generations to come will scarce believe that such a one as this ever in flesh and blood walked upon this earth..."

—Albert Einstein

REMEMBERING BAPU ON HIS MARTYRDOM DAY — 30TH JANUARY

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